THE WENTZEL LAKE SITE: A STRATIFIED PREHISTORIC ARCHAEOLOGICAL SITE IN THE CARIBOU MOUNTAINS, NORTHERN ALBERTA

GERALD THOMAS CONATY

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by

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ABSTRACT

The Wentzel Lake site (Borden designation IfPo 1) was a stratified site located in the Caribou Mountains of northern Alberta. Three major stratigraphic components were recognized, and the artifact assemblages from each were described. Material from the initial occupation, which had a maximum date of 4,765 ± 85 B.P., was stylistically similar to assemblages from the Early Taltheilei tradition. A second occupation, which dated from 3,585 ± 60 B.P., contained material which was indicative of influences from the contiguous Plains cultures. Flaking patterns and the presence of grinding on the lateral margins of the basal portions of projectile points indicated that the two occupations were culturally continuous. In addition, palaeoclimatic and palaeocultural sequences from adjacent areas were presented. It was hoped that such data would enable the material from the Wentzel Lake site to be understood in its proper context.

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1. INTRODUCTION

The archaeological investigation of the western Canadian subarctic is at the exploratory stage. Although the cultural sequences proposed over a quarter of a century ago (MacNeish 1951, 1953, 1954, and 1955) are being constantly reevaluated as new data are amassed, substantial spatial and temporal hiatuses remain. The discontinuity in our knowledge of the region is, at least partially, a function of the local physical environment. Dense bush and poorly drained soils made cross-country travel prohibitive for prehistoric hunters and gatherers. Rather, movement during the frost-free months was probably restricted to the navigable waterways. The ensuing settlement pattern presents a compound problem for the archaeologist: the winter camp sites within the forest interior will have virtually disappeared in the podzolic soils; on the other hand, the summer sites located along rivers and streams are susceptible to the ravages of annual flooding. In either case, when archaeological sites are located the soil profile is generally too shallow to provide an adequate separation of the prehistoric components.

The sandy beaches which occur intermittently along the margins of innumerable lakes may provide a contrast to this situation. In these instances well stratified deposits may provide indications of the local cultural sequence. Such a site was located on the south shore of Wentzel Lake (Donahue 1976: 33). Initial test excavation revealed a cultural continuum dating from 5,220 ± 140 B.P. Although cultural material was associated with all dated strata, no diagnostic artifacts were recovered at that time.

THE PRESENT STUDY

Purpose

The 1976 investigation of the Wentzel Lake site was undertaken in an attempt to expand the data base provided by Donahue's earlier study (ibid: 33-37). To this end, the field strategy comprised three aims: the recovery of culturally diagnostic material; the testing of various areas of the site to determine if differential occupation patterns existed; and the sampling and correlation of the stratigraphic sequence throughout the site area. By so orienting the recovery phase of the project it was hoped that the data could be integrated into a meaningful analysis of the cultural sequence at the site in terms of the stylistic change of artifacts as well as patterns of occupation at the site.

The analysis of the excavated material attempts to achieve several ends. First, as complete as possible a presentation of the artifact data is presented. This, hopefully, will facilitate comparisons with other sites in the Boreal Forest. Second, an analysis of the intrasite artifact distribution is undertaken as a means of separating and identifying various occupations and of determining the reason for the occupation of the site. In view of the lack of faunal and botanical remains within the stratigraphic sequence, the analysis of site use is necessarily inferential. Finally, the excavated material is compared with other sequences from the western Canadian subarctic and with sites from the contiguous Barrenlands. It was anticipated that, as the Wentzel Lake site is located near the southern edge of the

Boreal Forest, the local archaeological sequence would reflect influences from the more northerly forest areas as well as from the neighbouring Barrenlands (located to the northeast) and the Parklands (located to the south). The paucity of clearly defined cultural sequences from the Boreal Forest often leads to the elucidation of relationships which are, unfortunately, largely speculative.

Format

This dissertation comprises three parts. The first part, including chapters two, three and four, presents the physical and cultural environment of the Wentzel Lake site. It is an often stated axiom that man does not exist in isolation from the physical world. This is most apparent in the Boreal Forest where not only are the economic resources predetermined, but often the accessibility of various areas is limited. The detailed discussion of the local physiography, drainage, soils, geology, flora, fauna and meteorology is included to emphasize the influence of the natural environment. The physiography, drainage, soil types and meteorology provide either barriers or access to different localities during different seasons. The geology may provide the raw materials for the lithic tools. The recovery of exotic materials may be indicative of intergroup exchange networks. Finally, the flora and fauna provide the food resources and many production resources of the cultural group. This is not to say that the physical environment predetermines the development of a culture. It does, however, place constraints upon the material aspects of cultures with a low level of technological development.

The ethnographic overview is included as an example of the means by which a group may adapt to this part of the Boreal Forest. Special reference is given to the Beaver Indians, who were the protohistoric occupants of this area (Mackenzie 1931; Osgood 1936). Although their residence in the the area cannot be projected into prehistoric times, an account of their lifeways provides a frame of reference for the interpretation of the archaeological data.

A chapter on the regional prehistory summerizes archaeological sequences from the western Boreal Forest and southern Barrenlands. This compendium is intended to provide a perspective for the interpretation of the material recovered from the Wentzel Lake site. Just as the physical environment set the limits within which prehistoric cultures existed, the cultural environment influenced the way in which local groups developed. Within the archaeological record this is most visible in the styles and manufacturing techniques of the lithic remains. Thus, the diachronic change within a single site may be best understood in light of the surrounding regional sequences.

The data recovered from the Wentzel Lake site is presented in chapters five, six and seven. Chapter five is concerned with the approach to the excavation of the site. The non-probablistic sampling design employed was chosen in an attempt to test a major portion of the site while, at the same time, facilitating the identification and correlation of the various stratigraphic levels.

The stratigraphic sequence, as determined on the basis of the 1976 excavations, is divided into two parts: the upper, or cultural levels which are correlated across the entire site; and the lower, noncultural levels which are described in terms of blocks of units. These blocks provide a sequence from the beach, southward to the forest's edge. Four radiocarbon dates are then discussed and their significance is evaluated.

A formal (as opposed to functional) approach is taken toward the analysis of the artifacts. Each of the ten artifact categories is described and their stratigraphic distributions are provided. The vertical distributions are then grouped into separate cultural assemblages and the variety of lithic materials is discussed. Finally, a nonstatistical analysis of the horizontal artifact distribution is undertaken with the understanding that preferential use of specific raw materials and differential occupation of the site may provide additional means of identifying cultural assemblages.

Interpretations and conclusions are presented in chapter eight. The pattern of occupation reflected in the various assemblages is discussed and inferences are made regarding resource utilization. The local archaeological sequence is then compared with the regional prehistory. Relationships between this site and those in adjacent areas are discussed in terms of population migration and cultural diffusion.

Finally, a detailed metric description of the 'tools' recovered from the Wentzel Lake site is provided in Appendix I. These data are included as a reference for comparisons with other archaeological material.

2. GEOGRAPHICAL AND ENVIRONMENTAL SETTING

PHYSIOGRAPHY

The Interior Plains extend from the Amundsen Gulf in the north to the St. Lawrence Lowlands in the south, and are bordered on the east by the Canadian Shield and on the west by the Cordilleran Region. These plains have been further divided by Bostock (1970) into ten units, with the Alberta Plateau section covering most of northern Alberta. The Alberta Plateau (bounded by the Great Slave Plain on the north, the Saskatchewan Plain on the east, the Alberta Plain on the south, and the Foothills of the Rocky Mountains on the west) has been described as a feature composed of "...a ring of plateaux separated by wide valleys". (Bostock 1970:20). Most prominent of these plateaux are the Cameron Hills in the northwest, the Caribou Mountains in the northeast, the Cheecham Hills in the southeast, and numerous other hills which occur along the north side of the Athabasca River (Figure 1).

The upland areas are separated by wide lowland plains. The most significant of these are the Fort Nelson Lowlands, which separate the Cameron Hills from the Caribou Mountains and are the drainage channel of the Hay River; and the Peace River Lowlands, which form the south border of the Caribou Mountains and contain the Peace River. In addition, the Caribou Mountains are adjoined on the north by the Hay River Plain and on the east by the Wood Buffalo Plain. The rise in elevation (from 454.4 m to 969.7 m a.s.l.) exhibited by this upland feature has contributed to its description as a series of "...residual hills formed by the erosion of the surrounding rock" (Allan 1943: 16).

NORTHERN ALBERTA AND

ADJACENT AREAS

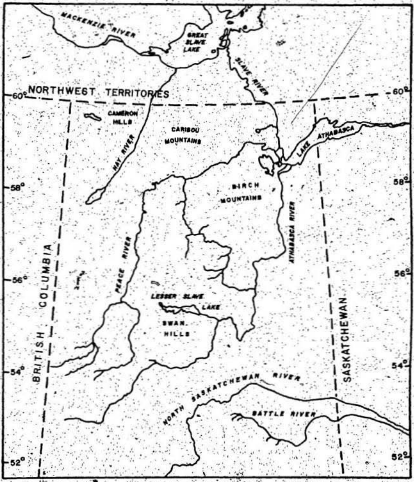


FIGURE 1

The erosion has been interpreted as being a result of river downcutting rather than glacial action.

DRAINAGE

Being an isolated upland surrounded on all sides by lower plains, it is not surprising that the waterways of the Caribou Mountains flow in all directions. The presence of the Hay River on the west and the Peace River on the south point to these two directions as the primary watersheds. Of the tributaries of the Peace River, the Caribou, Laurence, Wentzel, and Garden Rivers and Carl Creek are the most significant. These flow from the many lakes throughout the area. The largest lakes are Margaret Lake (ca. 119.1 km^2), Eva Lake (ca. 25.32 km^2), and Wentzel Lake (ca. 13.1 km^2). These are generally surrounded by poorly drained moss bogs or muskeg (Lindsay et al 1960). Permafrost, at a depth of 4.7 to 9.4 cm, also affects the drainage pattern. Throughout the spring and early summer the upper portion of the frozen strata melts contributing to higher lake and river levels. Towards the autumn, as this melted layer drains off, the water levels drop significantly and the smaller streams cease to flow.

SOILS

Developed mineral soil profiles from the Caribou Mountains are rare. This is the result, at least partially, of permafrost occurring immediately below, or within the peat stratum (Lindsay et al 1960: 13). Where such profiles are obtainable a Grey Wooded soil which developed on glacial till is described. These are more or less restricted to the downslope portion of the area, adjacent to the better drained lowlands.

Within the uplands, sandy beaches often occur in discontinuous sections along lake shores. Here again, soil development is poor, although the azonal strata often extends to a great depth before underlying glacial till is reached. These beaches consist almost entirely of lacustrine deposits, although some aeolian reworking of surface material is not uncommon in areas of sparse ground cover.

GEOLOGY

The Interior Plains, in general, are underlain by Late Proterozoic, Palaeozoic, Mesozoic, and Tertiary strata in a horizontal bedding configuration (Bostock 1970: 19). The Mesozoic sediments are represented in the Caribou Mountains by shales and sandstones of the lower-upper (Santenian to Cenomanian), and upper (Cenomanian) Cretaceous age. In the higher areas the former is represented by shale outcrops belonging to Dunvegan formation. The latter overlie the earlier deposit in the lower regions and is assigned to the Smokey River formation.

Prest (1970: fig. XII-15) has included the Caribou Mountains within the area which was completely covered by ice until ca. 10,500 to 10,000 B.P. Geomorphologically, he ascribes the uplands to a subdivision characterized by hummocky terrain including dead ice and disintegrated moraines. These conditions may have resulted from the persistence of ice in regions of higher elevation. Significantly, this area was not included in the area of maximum glacial lake coverage, although the region surrounding it was submerged under glacial Lake Peace. Presumably, the differential altitude resulted in the Caribou Mountains forming an island.

Some authors have described the Caribou Mountains as a nunatak (Moss 1955; Scheelar and Macyk 1972). The thickness of the ice during maximum glaciation precluded any such possibility:

> The glacier came from the Keewatin center of glaciation, west of Hudson's Bay. ... The thickness of the last glacier in east-central Alberta was approximately 5,000 feet. ... As the area under consideration is about 400 miles further north than is east-central Alberta, it is reasonable to assume a minimum thickness of one mile of ice during the glacial maximum in the area. The mean direction of flow of the last glacier was to the west-southwest. (Bayrock 1960: 44)

The maximum altitude of the Caribou Mountains is ca. 969.7 m a.s.l. However, it does seem likely that this area was one of the first to become deglaciated as the ice front retreated.

Glacial erosion of the bedrock material was slight (Bayrock 1969). The upland "remnant hills" may, therefore, be considered to have been present during preglacial times as erosional features resulting from downcutting of river channels. This erosion may have resumed as the ice retreated and the meltwater from the dead ice ran into the old drainage channels. However, these channels were often blocked with ice, causing extensive proglacial and supraglacial lakes to form. While beach formation was rare, these lakes contributed large amounts of sediments in the form of glacio-lacustrine deposits. These deposits were concentrated in the lowland areas. On the upper slopes unsorted glacial till formed the major Pleistocene deposits.

FLORA

The vegetation of the Caribou Mountains conforms, for the most part, to the bog forest section of the Boreal Forest region of Canada

(Moss 1955; see Table 1). In particular, the Picea mariana-Sphagnum spp. association typifies much of the ground cover. This is characterized by:

> ... tamarack, paper birch and certain willows associated with spruce. The flora is characterized by bog moss, especially Sphagnum spp. The chief flowering plants are Ledum groelandicum; Vaccinium vitis-idaea var. minus, Rubes chamaeours, and Smilacina trifolia. The most striking feature is the uneven floor of Sphagnum mounds and the nearly continuous cover of Labrador tea. This association has arisen in depressions through acid bog stages and the production of a considerable thickness of Sphagnum peat. It is interpreted as a subclimax community maintained as such by prevailing edaphic conditions and by periodic burning. (Moss 1955: 531)

Another variation of the bog forest, the Picea mariana-Hylocomium splendens (black spruce-feather moss) association, develops in the more level areas. Species found within this assemblage include Peltigera aphthosa and Cladonia spp., Ledum groelandicum, Vaccinium vitis-idaea var. minus, Rosa spp., Rubes spp., Equisetum spp., Cornus canadensis, Petasites palmatus, Linnaea borealis var. americanus, Mitella nuda, Rubes pubescens, and Carex spp. (Moss 1955: 530). This edaphic climax develops through sedge-grass-willow seral communities and is maintained by poor drainage and periodic burning.

In the ecotone between the Boreal Forest region and the sub-alpine forest region there occurs the lower foothills forest section (Rowe 1972) or the boreal-cordilleran transition zone (Moss 1955). It is described thus:

> The distinctive tree species is the lodgepole pine which, with trembling aspen and balsam poplar, has assumed a dominant position over much of the area in the wake of fire. In older forest stands white spruce is an important constituent and black spruce is often present too. White birch and tamarack have scattered representation with the above species on appropriate well-drained or poorly drained sites, respectively. (Rowe 1972: 38)

TABLE 1. FLORA IDENTIFIED AT THE WENTZEL LAKE SITE.

LICHENS

Cladonia spp.
Alectoria jubata
Usnea spp.
Cetrarria pinastri
Parmelia sulcata
Peltigera aphthosa
Peltigera canina
Stereocaulon spp.

MOSSES

Polytichum spp.
Ceratodon purpruea
Sphagnum spp.
Dicranum spp.
Unid spp.

VASCULAR PLANTS

Carex spp.
Eriophorum spp.
Populus tremuloides
Salix spp.
Alnus crispa
Betula papyrifera
Betula pumilaivar glandulifera
Epilobium angustifolium
Cosnous canadensis
Larix laricina
Picea glauca
Picea glauca var. porsildii
Picea mariana
Pinus banksiana
Pyrola asarifolia
Arctostaphylos rubra
Arctostaphylos uva-ursi
Ledum groenlanicum
Ledum palustre
Ribes spp.
Fragaria virginiana
Rosa woodsii
Rubus acaulis
Rubus chamaemorus
Empetrum nigrum
Sheperdia canadensis
Oxycoccus microcarpus
Vaccinium uliginosum
Vaccinium vitis-idaea
Gentianella amarella
Mertensia paniculata
Castilleja spp.
Pedicularis spp.
Linaea borealis
Achillea millefolium
Arnica spp.
Petasite palmatus
Solidago spp.

The reported occurrence of a Picea mariana-Pinus contorta association on the upper slopes of the Caribou Mountains (Moss 1955: 531) has led to the area being described as a part of this forest section. The isolated nature of this occurrence has been used as a basis upon which to propose that this phytogeographic region survived glaciation as a nunatak area similar to the Cypress Hills. As has already been noted, the thickness of ice at maximum glaciation precluded any such survival. Of more merit is Hansen's (1950) argument that the ice-free corridor along the eastern slope of the Rocky Mountains was well forested during the late Wisconsin and served as a refugium for the cordilleran biota. The ecotonal assemblage may have migrated eastward from this locality in the wake of the retreating glacier. Subsequent ice re-advances may have isolated relics of this assemblage in the higher areas which then acted as nunataks.

FAUNA

The Caribou Mountains have been included in the large faunal area identified as the Canadian Life Zone (Soper 1964: 34). This zone, the largest in Alberta, is considered to be a heavily and uniformally forested area with a very diverse complement of fauna. Some mammalian species which have been identified by Soper as characteristic of this zone are listed in Table 2. Of the mammals listed, some are found in the adjacent Hudsonian and Transition zones as well. The Hudsonian zone is characterized by a less diverse vegetation and has a reduced mammalian population. In Alberta a modified version of this life zone occurs in the northern corner of the province, in an area defined as the Tazin Highlands. Mammals found in this zone are listed in Table 3. It

TABLE 2. MAMMALS OF THE CANADIAN LIFE ZONE (FROM SOPER 1964).

* INDICATES SPECIES OBSERVED.

<u>Sorex c. cinerus</u> (cinereous shrew)

<u>Sorex a. arcticus</u> (saddle-back shrew)

<u>Sorex p. palustris</u> (water shrew)*

<u>Lepus a. macfarlani</u> (Mackenzie varying hare)

<u>Eutamais m. borealis</u> (little northern chipmunk)*

<u>Glaucomys s. sabrinus</u> (Hudson Bay flying squirrel)

<u>Castor canadensis</u> (Canadian beaver)*

<u>Peromyscus m. borealis</u> (boreal white-footed mouse)

<u>Phenacomys u. mackenzii</u> (Mackenzie Phenacomys vole)

<u>Vulpes f. abietorum</u> (British Columbia red fox)

<u>Ursus americanus</u> (black bear)*

<u>Martes a. actuosa</u> (Alaskan marten)

<u>Mustela v. lacustris</u> (Hudson Bay mink)

<u>Lynx c. canadensis</u> (Canada Lynx)

<u>Odocoileus h. homionus</u> (Rocky Mountain mule deer)

<u>Alces a. andersonii</u> (northwestern moose)

<u>Rangifer c. sylvestris</u> (western woodland caribou)

<u>Bison b. athabascae</u> (wood buffalo)

TABLE 3. MAMMALS OF THE HUDSONIÔN LIFE ZONE (FROM HARPER 1932 AND SOPER 1964).

* INDICATES SPECIES OBSERVED.

Peromyscus municulates borealis (boreal white-footed mouse)
Acthrionomys gapperi athabascae (Athabasca red-backed mouse)
Zapus hudsonius hudsonius (northern meadow mouse)
Synaptomys b. chapmani (Chapman lemming vole)
Phenacomys i. levis (Alberta phenacomys vole)
Microtus r. richarsonii (Richardson's vole)
Microtus l. vellerosus (longtailed vole)
Eutamais minimus borealis (Liard River chipmunk)
Eutamais a. ludibundus (Hollister chipmunk)
Tamaisciurus h. richarsonii (Richardson's red squirrel)*
Sciurius hudsonicus hudsonicus (Hudson Bay red squirrel)
Marmota momax canadensis (Canada woodchuck)
Muphitis hudsonica (northern plains skunk)
Lutra canadensis (Canadian otter)
Castor canadensis (Canadian beaver)*
Mustela cicognanii richarsonii (Richardson's weasel)*
Mustela vison lacustres (Preble's mink)
Ondontra zibethica spatulata (northwestern muskrat)
Lepus arcticus canus (Keewatin arctic hare)
Lepus americanus americanus (Hudson Bay varying hare)
Gulo luscus (Hudson Bay wolverine)
Lynx canadensis canadensis (Canada lynx)
Vulpes alascensis abietorum (British Columbia red fox)
Alopex lagopus innuitus (continental arctic fox)
Canis latrans (northern coyote)
Canis occidentalis (northern grey wolf)*
Ursus americanus americanus (black bear)*
Ursus horriblis (grizzly bear)
Ursus richarsonii (barren ground bear; polar bear)
Odocoileus hemionus hemionus (mule deer)
Alces americanus americanus (eastern moose)
Rangifer tarundus (barren ground caribou)
Rangifer caribou sylvestris (woodland caribou)
Bison bison athabascae (wood buffalo)

is apparent from these tables, combined with personal observations, that the Caribou Mountains may be more accurately assigned to the modified Hudsonian zone.

Numerous species of avifauna migrate through or nest in this region. The flyways of the white-fronted goose, whistling swan, Canada goose, and sandhill crane all pass over the Caribou Mountains, as do the migration routes of such diving ducks as the greater scaup, surf scoter, and oldsquaw. The bufflehead and goldeneye are the only two diving ducks which are known to nest in the area. Common surface-feeding ducks include the mallard, pintail, American widgeon, blue-winged and green-winged teal, and the shoveller. Game birds such as the spruce grouse, sharp-tailed grouse, and willow ptarmigan and, more rarely, the ruffed grouse also inhabit this portion of the coniferous forest.

The numerous lakes are somewhat sparsely populated by such species of fish as lake trout, walleye, northern pike, and arctic grayling (Smith 1970).

METEOROLOGY

The Caribou Mountains are subject to short summers which average 60 frost-free days per year (Atlas of Alberta 1969). The average temperature during the warmest month (July) is 20° C, while during the coldest month (January) it is -29° C. Annual precipitation is 460 mm, although the variability of precipitation is high (± 40%). There is a very low frequency of thunderstorms and hail. The proximity of an Arctic high pressure cell centred in the Mackenzie River valley during the winter results in a predominantly northwest-southeast wind. This high retreats northward during the summer, and is replaced by a series of low pressure cells. As a result, the winter wind pattern is replaced by one in which no single direction prevails.

PALAEOECOLOGY

An explanation of palaeoecology has been offered thus:

> Fossils were once animals and plants, and were therefore governed by precisely the same ecological factors as now govern living animals and plants. Palaeoecology is therefore a study of these factors and how they affected the mode of life of organisms in the past.
> (Dictionary of Geological Terms 1972: 333)

The factors considered in a reconstruction of the palaeoenvironment of the northern interior of Canada included soils (Bartley and Matthews 1969; Bryson et al. 1969; Larsen 1965), wind patterns, and changes in the seasonal patterning of the arctic and continental air masses (Nichols 1969b; Namais 1970). Furthermore, it has been shown (Nichols 1967a) that changes in the palaeoenvironment may be temporally correlated over large areas of the northern hemisphere. As there was relatively little data from the immediate vicinity of the Caribou Mountains, studies from contiguous areas were considered in an attempt to reconstruct the palaeoecological sequence.

Two palynological studies conducted within the Boreal Forest, south of the Northwest Territories, have contributed to a description of the sequence of forest establishment in the wake of the retreating glaciers. A core from "Lake A" near Prince Albert, Saskatchewan, has been divided into five zones by Mott (1973). Zone A-V, with a basal date of ca. 11,560 ± 640 B.P.: 9610 ± 640 B.C. was defined as the Picea-Cyperaceae zone. Picea and Cyperaceae were abundant at that time, with Shepperdia spp. and Salix spp. consistently present in small amounts.

Populus spp. was not prevalent, and deciduous elements were absent. In the next zone, A-IV, *Picea* spp. and Cyperaceae declined, *Betula* elements increased somewhat, and herbs increased significantly. This was compared to the mixedwood section of the Boreal Forest, with an under-representation of *Pinus*. In zone A-III *Picea* and Cyperaceae continued to decline with a concomitant rise in herbs. A decline in herbs and an increase in *Betula* and *Alnus* in zone A-II has been interpreted as a return to forested conditions. By zone A-I *Pinus contorta* had invaded and modern conditions were reflected.

A sample from "Lake B", taken from the same area, supported this general scheme. Zone B-V, dated at 10,260 B.P.: 8310 B.C., was dominated by *Picea* spp. Grasses increased through zone B-IV and were joined by a high percentage of herbs in zone B-III. This condition remained the same through zone B-II. The *Pinus* and *Picea* dominated forest return was reflected in zone B-I.

Research in the Keewatin District, Northwest Territories, has indicated that the northern boundary of the Boreal Forest has fluctuated significantly over the past 8,000 to 10,000 years (Bryson *et al.* 1965; Nichols 1967a, 1967b). The scheme presented here was taken primarily from Nichols' works at Ennaidai and Lynn Lakes. Although both sets of data indicated the same general trend, the Ennaidai Lake material was preferred as:

> Its ecotonal location and Sphagnum peat constitution make it more sensitive to climatic changes than Lynn Lake, the latter being in a more "complacent" position in the middle of the Boreal forest. (Nichols 1967b: 1665)

The initial phase, placed at *ca.* 8,000 - 5,700 B.P. was a warm and moist period characterized by high percentages of Alnus and Picea pollen and Sphagnum spores. The forest extended north at that time with only a limited tundra present. Although this warming trend continued from ca. 5,700 to 3,600 B.P., the lower percentages of Sphagnum spores indicated a drying trend. A decline of Picea at ca. 4,800 B.P. was indicative of a cooling episode at the outset of that period. From 3,600 to 2,600 B.P. the Sphagnum spore count and the amounts of Picea pollen present varied. That was, in general, a cooler period with the arctic front fluctuating about Ennaidai Lake. A drier, colder climate from ca. 2,600 to 1,500 B.P. was suggested by low percentages of Sphagnum spores, irregular amounts of Picea pollen, and an increase in Ericales pollen. At that time the air masses moved south, accompanied by a spread in tundra associations. A peak of Picea and Sphagnum elements was noticeable at ca. 1,500 B.P., at a time when the forests moved further northward. By ca. 1,000 B.P. this climatic amelioration had waned and the treeline had retreated south to near its present position. Non-arboreal elements such as Ericales, Ledum palustre, and Vaccinium vitis-idaea increased as arboreal pollen declined.

Data from the northern Plains corroborates much of the foregoing sequence. The chronology described here was taken from Reeves (1969) and provided greater detail in the later time periods. This scheme began with the Terminal Pleistocene period (ca. 17,000 - 13,000 B.P.), during which a grassland environment was maintained by warm, dry air in the winter and strong westerly winds in the summer. The Boreal period (ca. 10,500 - 7,000 B.P.) was climatically similar to the present time with a predominantly winter-spring storm pattern, strong westerly winds, dry air, and a generally drier climate than the preceding period. This drying trend continued through the Atlantic interval (ca. 7,500 - 6,000 B.P.). During this period the grass-chenopod-compositeae complex reached its maximum extent as the grassland expanded into the Parkland-Boreal Forest area. A subsequent cooling trend during the Sub-Boreal period (ca. 5,000 - 4,000 to 3,000 - 2,500 B.P.) resulted in the Boreal Forest expanding southward to its present position. This southward movement extended through the Sub-Atlantic period (ca. 2,500 - 1,500 B.P.) as summers were more cloudy and wet, and winters more stormy. A return to conditions similar to those of the Atlantic period occurred during the Scandia interval (ca. 1,500 - 1,000 B.P.). This was followed by a change to cooler, wetter weather and a southward expansion of the Boreal Forest during the Neo-Atlantic (ca. 1,000 - 700 B.P.). An increase in the predominance of the westerlies, and the drier climate of the Pacific period (ca. 700 - 400 B.P.) resulted in a retreat northward of the Boreal Forest. Finally, the Neo-Boreal period (ca. 400 - 150 B.P.) was characterized by cool summers and cold autumns.

These palaeoclimatic sequences indicate that the borders of the Boreal Forest fluctuated north and south in response to changing moisture and temperature regimes. In the northern part of the coniferous forest such changes could have substantially affected the availability of numerous economically important species.

3. ETHNOGRAPHIC OVERVIEW

The identification of the ethnohistoric inhabitants of a given region may provide the archaeologist with a basis for understanding the ways in which the prehistoric inhabitants exploited their environment. In addition, knowledge of the most recent cultural group to occupy a locale offers the archaeologist a means for organizing his data such that cultural affinities may be extrapolated back through time using the direct historical approach (Steward 1942). Finally, by studying the proto-historic culture and its relationship with neighbouring cultures, the networks and processes by which ideas were transferred may become apparent. Thus, an ethnohistoric summation of the study area may be invaluable in achieving three of the important objectives of archaeological research: 1) the reconstruction of culture history; 2) the reconstruction of lifeways; and 3) the delineation of culture processes (Binford 1968: 8).

Researching the ethnohistory of the Caribou Mountains is inhibited by two problems. The first of these is the lack of early records from the area. By the time literate explorers such as Alexander Mackenzie and David Thompson reached the Athabasca River drainage system in the late 18th century, the disruptive influence of the fur trade had already been felt. In discussing the derivation of the name Peace River, Mackenzie noted the expansion of the Cree (Knisteneaux) and the ensuing retreat northward and westward of the Beaver and Slaves:

> When this country was formerly invaded by the Knisteneaux, they found the Beaver Indians inhabiting the land about Portage la Loche; and the adjoining tribes were those whom they called slaves. They drove these tribes

> before them; when the latter proceeded down the river from the Lake of the Hills, in consequence of which that part of it obtained the name of the Slave River. The former proceeded up the river; and when the Knisteneaux made peace with them, this place was settled to be the boundary. (Mackenzie 1931: 5-6)

The delineation of the proto-historic boundaries is further confused by the ambiguous appellations used by the Cree for any foreign tribe and the inevitable misconstrual of these names by white traders and explorers.

Alan Bryan (1969: 35), in a discussion of the Cree expansion into Alberta at the time of contact, noted that a different transliteration of the Cree terms aiass-tsi-nō-wuhk and I-e-chi-ne-wuk would support either the hypothesis that the Blackfoot (asass-tsi-no-wuhk) originally occupied the area around Lesser Slave Lake (thus called Ai-ass-tsi-nō-wuhk Sa-ha-ki-gun) or the proposition that the Slave Indians (I-e-chi-ne-wuhk) extended south to that lake (called Hya-tche-nu S' gai'gan). A certain identification of the group which originally occupied the environs of Lesser Slave Lake was not proposed. Rather, it was concluded that:

> Most likely they were some group of Beaver Indians as Jenness (1955: 383) concludes, but the basis for Grinell's argument that they could have been Blackfoot cannot be ignored. Perhaps both hypotheses are partially correct. The link may be the otherwise unrecorded "Strong Bow Indians" located by Pond northwest of Lesser Slave Lake but south of the Peace. Perhaps these Indians were dispossessed "Slaves" of Lesser Slave Lake. (Bryan 1969: 37)

Even when the tribal affinity of a localized group can be identified, the distribution and subdivisions of the tribe often remain uncertain.

Osgood (1936) has attempted to order the geographical territories of the northern Athapaskan Indians. Either Beaver or Slave groups occupied the Caribou Mountains. The boundary between these two groups has been projected as a line paralleling the Peace River a few miles to the north (Osgood 1936: figure 1). The Beaver extension would have been the Vermilion group who lived along Paddle River and hunted west to Hay Lake and north and east to the Caribou Mountains. If the demarcation line is accurate, the Beaver Indians inhabited only the southernmost extension of this upland area. Although the majority of the region has been ascribed to the Slave Indians, by all historic accounts (Mackenzie 1931; Back 1970; McLean 1932; Simpson 1938) they preferred the region to the north and west of Great Slave Lake, along the Mackenzie River and its upper tributaries. This left the area to the south of Great Slave Lake and north of the Peace River only sparsely occupied by either Beaver or Slave Indians.

Thus, the apparent scarcity of a populace in the Caribou Mountains may have been a reality. It may also have been a reflection of the early explorers' tendency to travel via the large, navigable rivers, and hence avoid much of the interior area. The dense underbrush of the Boreal Forest, which often grows on a floor of muskeg, precluded efficient travel by foot over long distances in the summer months. The numerous large rivers found in the western extent of this forest zone provided easy access for the fur traders and later explorers. It is not surprising that the Caribou Mountains, which are bounded on three sides by major waterways, were mentioned only in passing. With the Slave River joining trading posts at Lake Athabasca and Great Slave Lake, the Peace River affording passage to the Rocky Mountains, and the Hay River offering access to the western end of Great Slave Lake, the absence of excursions into the poorly drained upland area is understandable. Whether or not the prehistoric peoples traversed the area on foot in winter must remain a matter of speculation.

Although the specific tribal affiliation of the palaeo-inhabitants of the Caribou Mountains may not be absolutely discernible, it is almost certain that they were Athapaskan-speaking people. Moreover, they were members of the division which:

> ... occupied the basin of the Mackenzie river to the edge of the Barren Grounds, where the lack of timber halted them, and perhaps also the hostility of the inland Eskimo. (Jenness 1937a: 36)

The area encompassed by these boundaries includes a variety of ecological zones, from the riverine environment of the Mackenzie, through such large lakes as Great Slave Lake and Great Bear Lake, to the diminutive flora of the Barrengrounds. The human inhabitants of this area wandered freely through all three, exploiting the resources of each as the seasons and their needs dictated. In fact, tribal differences may indeed have been very indistinct:

> There was no tribal organization and, among most groups, only a very limited consciousness. Northern Athabaskan culture has been described as consisting not of a series of neat cultural entities, but as a cultural continuum carried on by a series of interlocking groups whose individual lifeways differed only in certain minor details from those of their immediate neighbors. Such minor variations were observable only when they had built up into more significant differences, usually over considerable geographical distances. (Vanstone 1974: 8)

Therefore, while every attempt has been made to avoid the pitfalls of the doctrine of culture arealism, this concept seems particularly applicable to the situation at hand. What follows is a generalized description of northern Athapaskan culture. This abstracted cultural configuration provides a basis for understanding the archaeological culture encountered at the Wentzel Lake site.

Many authors have noted the occurrence of the loosely-knit band organization among hunting and gathering peoples:

> It is perhaps a truism that at the band level of integration and subsistence, formal authority and continuing leadership are rare. Surely one reason that this is the case is that people at this level cannot afford, cannot tolerate, having their freedom of movement and choice - that is, such freedom as the ecology permits - restricted for long by the only kind of strong authority that can emerge, i.e. the camp bully. (Slobodin 1969: 194)

The social organization of the northern Athapaskan tribes would seem to have conformed well to this model of an unstable aggregation of individuals. Groups became enlarged or decreased in numbers as the activity varied from the hunting of the larger herd animals to the procurement of smaller resources. Always, it would appear, leadership was conferred upon he who was most able and demonstrated the best judgement:

> In the earliest times of which we have record, the Sekanais were divided into bands, each of which possessed its own territory. Sometimes, the individual families scattered and hunted separately, sometimes they wandered in groups of two or three; yet just as frequently, perhaps they held together for mutual support and moved as a unit from one place to another within their domain. There were no family hunting grounds, no districts of which a family or small group of families claimed exclusive possession.
>
> Each band had a leader, who was neither hereditary nor elected, but acquired his position through force of character, skill in hunting, and sane judgement. His authority, therefore, was merely nominal; he was a leader, not a chief, and if he presumed to issue orders, he had no means of enforcing them. ... Parties that separated off from the band to fish, to hunt, or to raid neighboring tribes selected their own leaders.

> The only laws, therefore, were regulations prescribed by custom. Since every family was co-equal with every other, and often depended on its neighbors for support, it was necessary to consider all foods as common property whenever two or more families lived side by side. (Jenness 1937b: 44)

This egalitarian nature of resource management was contradicted only in two instances, aside from personal possessions. On the one hand, an individual could appropriate a beaver lodge by leaving an identifying mark upon it (Masson 1890: 68). In later times, as the impact of the fur trade became more pronounced, this practice was extended to all traplines. Family ownership may have been proclaimed over sites of chert quarries where materials might be gathered for the manufacture of tools (Morice 1894: 65). Traditional hunting territories were also recognized, but they were not regarded as the exclusive property of any one family and any individual was free to use the area. Perhaps one reason for this distribution of property was the lack of any formal means of settling disputes other than the blood feud. As no one would have been particularly anxious to instigate such a conflict, the threat of a blood feud became an important mechanism of social control.

The basic social organization was the patrilineal nuclear family. The residence pattern could be either patrilocal or matrilocal, but tended toward the former. When these family groups banded into larger organizations they usually did so along kinship lines, although this was by no means a strict rule. Polyandry and polygyny were commonly practised, often with a man marrying his widowed sister-in-law. The nuclear family was a complete unit of resource management, with division of labour according to sex:

> Practically all camp labour fell on the women, in order that the men might devote their whole time to hunting, which sometimes kept them away two or three days. It was the women, therefore, who carried the water and collected firewood, cooked the meals, cleaned the hides, and made the clothing. Often, when the men returned worn but successful, the women followed their trail and brought the meat to the camp; and in the march they carried all the camp paraphernalia so that the men could search ahead for game. (Jenness 1937b; 56)

To the list of female activities may be added the duty of collecting berries and other edible plants. Thus, with the women maintaining the camp and bringing in certain foodstuffs and the men harvesting protein resources, each such group was quite capable of providing the necessary items for subsistence.

The resources exploited by Indians in this area may be identified either as food resources or as production resources. The utilization of some materials for more than one purpose often obscures this dichotomy and necessitates a double classification of some items. In general however, the division is useful in enumerating the resources of the region.

FOOD RESOURCES

The floral substances which were important as food resources to the northern Athapaskans have been listed by Reverend A. G. Morice (1884, 1889). These are grouped here in Table 4 according to whether the items were used for food or medicinal purposes. In addition to the items listed, the cambium of spruce trees became an important food supplement in times of extreme need.

The collection of most of the floral foodstuffs was a seasonal activity, bringing large numbers of people together at sites of abundant

TABLE 4. FOOD RESOURCES (FROM REV. A. G. MORICE 1889, 1894).

NUTRIENTS

Amelanchier alnifolia	(service berry)
Vaccinium myrtillis	(ground berry)
Vaccinium myrtillis	(blue berry)
Vaccinium uliginosium	(bog bill-berry)
Oxicoccus palustris	(swamp cranberry)
Empetrum nigrum	
Viburnum pauciflorum	(high bush cranberry)
Shepperdia canadensis	(soapberry)
Arctostaphylos uva-ursis	(bear berry)
Rubus strigosus	(raspberry)
Fragaria canadensis	(strawberry)
Ribes nigrum	(black berry)
Lilium columbianum	(red lily)
Acorus calmus	(sweet flag)
Allicum cernum	(wild onion)
Erythronium gigantium	(dog-tooth violet)
Heracleum lanatum	(cow parsnip)
Berberes aquifolium	(Oregon grape-leaves)
Alcetoria jubata	(lichen)

MEDICINAL RESOURCES

Tatles (Polyporous officinalis)	panacea against biliousness
Abies nigra (roots)	febrifuge against skin inflammation
A. balsamea (roots)	febrifuge against skin inflammation
Juniperus occidentalis (boughs)	aid in curing measles and fever
Oxicoccus palustres (mash)	suppresses cutaneous eruptions in young children
Populus tremuloides (roots)	stops bleeding
Rubus strigosus (bark and leaves)	emminagogue
Viburnum opulus (bark and leaves)	remedy for blood spitting
Prunus pennsylvanica (bark and leaves)	remedy for blood spitting
P. virginiana (inner bark)	stimulant
Achilea millifolium	tonic
Aralia nudicaulis	tonic
Mentha virides	tonic
Ledrum palustre	tonic
Cornus stolonifera	used against running sores
Salix longifolia	used against running sores
Equisetum hyemale	alleviates retention of urine
Equisetum pratenes	alleviates retention of urine
Artemesia frigida	used to alleviate local pain
Conium maculatum (bulb)	eases violent pain
Fatasia horrida (mash)	aids in the expulsion of afterbirth
Shepperdia canadensis	used to cure eye disease
Rosa bleinda (tree root)	used to cure eye disease

growth. The products of the harvest were not totally consumed immediately, but were dried and preserved for year-long storage:

> These berries are preserved either sun-dried or compressed in thick cakes .... When the fruit has been collected in sufficient quantities, they build on the ground a sort of large boiling vessel with spruce bark supported by sticks driven into the soil. This being filled with service berries, they throw heated stones which in a few moments will have the double effect of boiling and pressing down the fruit whose juice escapes through a narrow conduit at the bottom side of the boiler into an adjoining flat vessel also made of the same material. When the liquid is thus all extracted, the residue of the larger vessel is thoroughly kneaded; after which it is spread out in thin layers ... and then exposed to the action of the sun and air. By frequently sprinkling the residue with the juice of the berry it coagulates into larger cakes ... These when thoroughly prepared will keep for years. (Morice 1889: 134)

The plant resources were utilized to good advantage. Given a good harvest, it is conceivable that the Indians could have been supplied with carbohydrates throughout the winter.

Smaller varieties of mammalian protein were Lepus americanus, Actomys culigatus, and Arctomys monax, all of which were snared by the individual huntsman. The ease with which these animals were hunted resulted in a ready source to be harvested by the small nuclear family group. Larger animals such as Rangifer caribou sylvestris, Rangifer tarandus, Alces americanus, and Bison athabascae required co-operative activity and the formation of the larger band organization:

> Indians ... always pitch their tent on or near to an eminence that affords a commanding prospect of the path leading to the pound; and when they see any deer going that way, men, women, and children walk along the lake or river-side under cover of the woods, till they get behind them, then step forth to open view, and proceed toward the pound in the form of a crescent. The poor timorous deer finding themselves pursued, and at the

> same time taking the two rows of bushy poles to be two ranks of people stationed to prevent their passing on either side, run straight forward in the path until they get into the pound. The Indians then close in, and block up the entrance with some bushy trees that have been cut down and lie at hand for that purpose. The deer being thus enclosed, the women and children walk around the pound, to prevent them from breaking or jumping over the fence, while the men are employed in spearing such as are entangled in the snares, and shooting with bows and arrows those which remain in the pound. (Hearne 1958: 50-51)

This method was not always successful, as often the caribou would have moved on before they could be surrounded. Of greater economic significance to the people bordering the Barrengrounds was the annual slaughter of the caribou as they forded streams and rivers on the autumn migration southwards. Snares were set in the forest region "... in suitable defiles ... frequented by the animals" (Morice 1889: 132).

The beaver (Castor canadensis), another important animal to these people, was hunted co-operatively by small groups of men. The hunters, having located a winter lodge, determined the beavers' pathways by sounding the ice with a moose horn. Once these were found, a hole was cut and a babiche net with warning devices attached to one end was set. The animals were then driven from their lodge by cutting a hole which would allow water to flood in. The animals were thus forced towards the nets, wherein they were entrapped and brought to the surface.

In addition to the dietary elements listed above, Ursus americanus, Ursus horribilis, and Lynx c. canadensis were also snared for food. Fish, although plentiful, was disdained by many of the people who thought of "... fishing as a degrading occupation unworthy of a hunter" (Morice 1889: 130). The further north one went, however, the more important fish became as a stable, if not preferred, source of protein (Back 1970; Hearne 1958). Meat products, like plant resources, were often dried and stored for the winter.

PRODUCTION RESOURCES

Just as a broad range of resources was used as food, the manufacture of other goods also took in a wide range of materials. These materials have been classified according to their use as hunting materials, clothing, shelter, or transportation. With regard to hunting, babiche cord, (made from animal gut) was of major importance in fashioning snares and nets. Also used were bows and arrows, the latter of which were tipped with stone or bone points. The arrow shafts were generally seasoned saskatoon (Amelanchier alnifolia) wood (Morice 1894: 55), to which the point was hafted with sinew. Bows of five and one-half feet or more in length were fashioned from mountain maple (Acer glabum). A blunt wooden arrow was also manufactured and used in conjunction with a willow bow to hunt smaller game.

Moose and caribou hide appear to have been the predominant material for the manufacture of clothing. The several tools associated with the preparation of the hides appear to have been generally formed from bone. A split caribou horn was used to scrape the fat from the fresh skin. This was followed first by the removal of hair with a scraper fashioned from the tibia of a caribou, and then by the piercing of holes near the edge of the skin with a bone awl made from the fibula of the caribou or black bear. Lines which were passed through these holes enabled the skin to be stretched upon a frame. The cuticle was then removed. Finally, the skin was tanned with the animal's brain and smoked (Morice 1894: 68-70).

In addition to the animals previously mentioned, certain species were sought solely for their furs. Among these were _Fibre zibethecus_ (muskrat), _Mustela martes_ (marten), _Mustela canadensis_ (fisher), _Lutra canadensis_ (otter), _Gulo luscus_ (wolverine), _Canis latrans_ (coyote), _Putoris vulgaris_ (ermine), and _Putoris vison_ (mink). Garments were often adorned with porcupine quills.

Being of a nomadic nature, the northern Athapaskans did not develop an intricate form of architecture. Rather, they utilized the resources at hand to construct adequate temporary shelters:

> The original Dénés lived in semi-circular huts of evergreen boughs laid over a framework of stout poles, mere shelters, in fact, rather than attempts at house building. Whenever practicable these shelters went in pairs, the second hut facing the first so as to complete the circle, yet leaving sufficient room between the two for the fire-place, which was common to both. This arrangement had also the advantage of creating a draft in the proper direction, and reducing to a minimum the amount of smoke in the lodges themselves.
>
> ....
>
> As they came into contact with the Crees of the south ... they developed the well-known Algonquin tepees, or conical skin-covered lodges, which are now in almost general use throughout the territory of the eastern Dénés. (Morice n.d.: 134)

As these tipis came into vogue, moose and caribou hides were used as the coverings by these northern people.

Water travel was the major means of movement throughout the Boreal Forest during the ice-free months. A typical form of canoe was the open decked variety found throughout this northern forest. In addition, a kayak variation has been described as an:

> ... undecked bateau-shaped canoe having a fair shearage in a long sweep from end to end, the stern profiles were nearly straight, the ends were raked rather strongly, and the bow was somewhat higher than the stern.
>
> ... It is estimated that canoes of this type, which has long been extinct and now can only be constructed from a model, were about 14'8" long and 30" to 36" in beam and probably were built of both spruce and birch. (Adney and Chappelle 1964: 159)

Use of this boat was apparently restricted to hunting activities in which animals were entrapped in the water courses by a number of kayaks and subsequently slaughtered. The more common form supplied a general-purpose means of quick travel from place to place.

Dogs, the only domestic animals in the region, performed various duties as beast of burden. With the advent of sleds, these animals became a major source of energy for winter transportation. Previously, however, they were a valued asset in the freighting of family possessions from one campsite to another. As a travois would have been of only minimal use in the dense forest, luggage was packed either by the women of the camp or was secured to the sides of the dogs. Both methods were often used.

Winter travel necessitated the use of snowshoes. In order to facilitate such movement, a number of styles which were suited to a variety of circumstances were devised. Although the model may have varied, materials were generally the same for all types. The side pieces were fashioned from black spruce, mountain maple, or mountain ash while the cross-bars were of willow or birch. The netting was made of babiche.

This pattern of exploitation may be described as a broad spectrum economy in which a large variety of resources were utilized. This pattern may be correlated to the nomadic mode of life. The wide range of raw materials which were used meant that frequent returns to any given site were not necessary. Weapons, bark containers, and shelter might easily be constructed from those resources closest at hand - willow, spruce, and birch. The seasonal nature of the berry harvest or the bison and caribou hunt were factors which necessitated an annual concentration of individuals. The social organization might be seen as a reflection of this exploitive pattern. Large numbers of individuals came together when resources were plentiful, or at times when the prospect of abundant food was imminent. During periods of reduced wealth the settlement pattern became that of scattered nuclear families or extended families. These were groups large enough to effectively harvest the resources, yet small enough to require a minimal input of energy.

4. REGIONAL PREHISTORY

The chronology of prehistoric occupation in northern Alberta is still at a formative stage. This is due to the lack of intensive study directed towards the area. Prior to Robert McGhee's 1965 survey of the W.A.C. Bennett Dam reservoir area along the Peace River, only five other projects had been undertaken. These may be summarized as follows:

> In 1956, E. M. Davis tested several localities around the town of Peace River with negative results ... About the same time, R. S. McNeish found a microblade site at Charley Lake, near Fort St, John, and Richard Forbis examined private collections in the Peace River block. Alan Bryan and Ruth Gruhn included the Peace River block and the Mackenzie Highway in their extensive survey of Alberta in 1964. In the same year, J. V. Wright and W. C. Noble surveyed the area from Peace River town as far downstream as they could drive. (Bryan and Conaty 1975: 64)

Within the past ten to twelve years, however, increased accessibility and intensified development of the north have resulted in more archaeological research being directed towards this region. In the northwestern part of the province, Ross Thomson surveyed the Saddle Hills in 1969-70 (Thomson 1973) while Gloria Fedirchuk conducted salvage excavations at the Penner site in 1973 (Fedirchuk 1974). At that time, the analysis of artifacts from the Karpinsky site in the Birch Hills was completed (Conaty 1974; Bryan and Conaty 1975). In 1974 Knut Fladmark completed the archaeological reconnaissance of the Peace River basin from the W.A.C. Bennett dam to the Alberta border. This survey was later extended downstream as far as Dunvegan (Bryan 1975). A survey of highway construction routes in 1975 encompassed a small area east of

Rainbow Lake, and an area west of Fort Vermilion (Losey and Priegert 1975).

Similar studies have been conducted in the northeastern section of Alberta. Here, the major studies have been J. V. Wright's survey of Lake Athabasca (Wright 1975) and Paul Donahue's intensive survey of the Caribou and Birch Mountains and segments of the Clearwater and Athabasca rivers (Donahue 1976). Highway surveys have also been conducted in this area by Timothy Losey (Losey and Priegert 1975; Losey et al. 1975) and Cort Sims (Sims 1975b; 1976b). In addition, the development of the Athabasca Tar Sands has led to a number of archaeological investigations in the Fort McMurray area (Syncrude 1973; 1974; Losey 1975; Sims 1975a; 1976a). Unfortunately, the very nature of highways reconnaissance and the survey of the tar sands leases has restricted the type and amount of data recovered. In addition, the nature of the archaeological materials found in the Boreal Forest and the poor preservative qualities of the environment mitigate against defining the culture history of northern Alberta on the basis of the studies enumerated above. Rather, data from the Mackenzie and Keewatin Districts of the Northwest Territories, northern Saskatchewan, and northern Manitoba must be incorporated into the discussion.

While it is not suggested that the region from the Mackenzie River on the west, to the Barrengounds on the east, was culturally homogeneous, I believe that a case may be made for incorporating data from these areas into the discussion of the archaeology of the Caribou Mountains. Ecologically, the area was very similar for; although species varied, it may be said that throughout the region the same resources were available for human consumption. If the historical accounts of the Chipewayn, Slave and, to some extent, the Beaver Indians are to be believed, the native inhabitants followed a subsistence pattern which cross-cut such ecological boundaries as existed. While relying as much as possible upon big game such as caribou and moose, these people also frequented the major lakes and rivers to fish. Given such nomadism and the consequent lack of distinct territorialism, it is to be expected that considerable tribal intermingling occurred. This intermingling was aided by the sharing of a common language. Concomitant with the sharing of territory and resources was the limited sharing of cultural practices. Thus, the archaeological materials recovered from seemingly disparate areas may exhibit traits which result from significant cultural interactions.

The archaeological reports concerned with related materials from outside of Alberta may be divided, quite arbitrarily, into those concerned with sites in the Northwest Territories and those dealing with sites in northern Saskatchewan and Manitoba. The latter division is composed of Sheila Minni's (1975) Master's thesis, Ronald Nash's (1975) report of surveys in the transitional forest zone of northern Manitoba and southern Keewatin, N.W.T., and J. V. Wright's (1975) summary of the prehistory of Lake Athabasca. The former two works identify the Chipewyan as the historical occupants of the area and, using the direct historical approach, delineate the sequence of occupations. Wright postulates an east-west dichotomy of influence, with Plains elements predominating on the western side of Lake Athabasca and Boreal Forest traditions exerting the major influence on the eastern shore.

The initial period of occupation proposed by both Minni and Nash is the Palaeo-Indian period which is typified by the Northern Plano tradition. The definitive artifact for this tradition is the Agate Basin projectile point, which has been found throughout most of the Great Plains in North America. In southern Canada, these points have been located primarily in undated surface finds. In the Mackenzie District, however, Noble places these components in the Acasta Lake complex dated at 5020 B.C. + 360: 6,900 + 360 B.P. (Noble 1971: 104) and 4900 B.C. (Gordon 1975: 92). In northern Saskatchewan an apparent cultural hiatus of approximately four thousand years exists between the initial peopling of the area and a subsequent incursion of the Arctic Small Tool tradition (ca. 1500 B.C. - 1000 B.C.). It has been proposed that this gap is a reflection of the limited fieldwork done in the area, and is not an actual abandonment by prehistoric people (Minni 1975: 49). The appearance of Arctic Small Tool tradition artifacts is correlated to a climatic deterioration and the movement southward of the Boreal Forest border. By 0 A.D. the forest had returned to northern Saskatchewan and the Arctic Small Tool tradition had been supplanted by the Taltheilei tradition (Gordon 1976c) as reflected in tools of the Hennessey and Frank Channel complexes. Taltheilei artifacts have recently come to be equated with Athapaskan peoples and a continuum has been drawn from the tradition's earliest appearance to historic times. Within the period of this Athapaskan occupation the influences of two southern complexes are evident. From the northern Plains of Alberta and Saskatchewan a weak influx of the Pelican Lake culture is observed. The presence of Clearwater Lake Punctate type pottery and small side-notched, square-based points with no basal or lateral grinding is indicative of a northern extension of Woodland Cree from south-central Saskatchewan and Manitoba (Minni 1975: 58).

As already noted, Nash agrees that the Agate Basin culture group represents the first population to inhabit the area. However, he views this group as only one of several early peoples to have resided in the area. These groups are represented by a knife resembling Sandia II bifaces and a "... large stemmed point similar to both Alberta and Taltheilei types ..." (Nash 1975: 165). The cultural discontinuity described by Minni is not in evidence in northern Manitoba. Instead, a poorly represented Early Archaic period is proposed for the time period between ca. 4000 B.C. and 1000 B.C. The Late Archaic period occurred subsequent to this and continued until contact. In light of the long time span given for this period and the different ecological zones encompassed by his study, Nash notes a variety of external influences during this last period, most important of which is that of the Taltheilei tradition.

The Palaeo-Indian period is poorly represented in the Lake Athabasca area. This period, from approximately 6500 B.C. to 1500 B.C., was characterized by a warming trend which facilitated movement of the treeline approximately 200 miles north of its present position. The occurrence at that time of Palaeo-Indian and Shield Archaic materials in southern Keewatin District has been suggested as an indication that these populations were restricted to areas which were in close proximity to the Barrengrounds and the caribou herds found therein (Wright 1975: 140). The subsequent cold period, lasting from 1500 B.C.

to 200 B.C., resulted in a contraction of the treeline and a southward movement of the caribou populations. Elements of the Arctic Small Tool tradition, which apparently occurred at Lake Athabasca, have been interpreted as evidence of the most southerly extension of these Arctic hunters. By 700 B.C., the Arctic Small Tool tradition people had returned northward. Their tools were replaced by those of the Taltheilei tradition at 400 B.C. This proto-Athapaskan culture exerted a strong influence along the eastern margin of the lake, eventually giving rise to the historic Chipewyan and Yellowknife Indians. On the western shores of Lake Athabasca a projectile point has been identified as Oxbow and has been used as a basis for suggesting an incursion of northern Plains cultures as early as 3000 B.C. (Wright 1975: 137). Other material has been identified as representing Pelican Lake and Besant phases, with projected dates of between 1000 B.C. and 700 A.D. Wright concludes that these elements represent "... prehistoric remains of the historic Athapaskan-speaking Beaver Indians" (Wright 1975: 137).

Archaeological work in the Northwest Territories which is relevant to this study was initiated by R. S. MacNeish more than twenty years ago (MacNeish 1951, 1953, 1954, and 1955). As a result of his survey along the Mackenzie River valley a number of chronologies have been set forth. The first of these, encompassing the period between ca. 10,000 B.C. and 950 B.C., is composed of three complexes. The earliest, the Taltheilei complex (ca. 10,000 B.C. to 8000 - 5000 B.C.), is characterized by long, incipient-stemmed narrow points with grinding along the finely retouched edges and long, narrow flake scars on the surface of the blades. The material from which most of the artifacts are fashioned is a shale, the source of which has been identified as the eastern end of Great Slave Lake. MacNeish (1951:38) tentatively links this Taltheilei complex to the Yuma point manufacturers far to the south. Following Taltheilei is the Artillery Lake complex which lasted from ca. 5000 B.C. to 2000 B.C. The diagnostic artifacts of this complex are "... long, narrow lanceolate points with narrow, straight, or convex bases. The flaking on their blades is well done, and parallel (sometimes oblique) flakes extend halfway across the blades". (MacNeish 1951: 38). These artifacts are made exclusively from quartzite. The most recent complex described is the Lockhart complex from ca. 2000 B.C. to 0 A.D. Here, the distinctive artifacts include semi-lozenge shaped points, round-based points, and side-notched and corner-notched points, most of which are made from quartzite. Also present are long, narrow and large, ovoid blades. These materials are believed to be related, in a very general way, to materials from southern Manitoba.

Another sequence has been derived from materials from Great Bear Lake (MacNeish 1955). Although no dates are presented for this chronology, three complexes have been proposed. The earliest of these is the Franklin Tanks complex typified by what has been described as a Plainview point with retouched edges which have been ground along their basal third. A middle period is identified by the Great Bear complex. Finally, the N. T. Docks complex was proposed with:

> ... side-notched point, lamellar flakes (and, inferrentially, polyhedral cores), lamellar flakes with one of the sides retouched, lamellar flakes with a notch, keeled side-scrapers, convex end-of-the-blade scrapers, and fan shaped snub-nosed

> scrapers) and, perhaps, if the one burin-like object of the N. T. Docks level is really a burin, corner burins. (MacNeish 1955: 74)

While the early complexes are believed to have affinities with the Plains, this last is related to cultures of the Boreal Forest in the Northwest Territories, the Yukon, and Alaska.

A more current analysis of the archaeology of the western District of Mackenzie, N.W.T. has ensued from J. V. Millar's work at Fisherman Lake. The initial complex, dated at perhaps 15000 B.C., is poorly defined. It is followed by the Cordilleran complex, dated from 12000 B.C. to 8000 B.C. This complex is identified by a blade-core technology, large bipoints, burins, and various scraper forms. This is succeeded by the Stem Point complex with its straight stemmed points and absence of blade-core technology. This complex is dated from 7500 B.C. to 6000 B.C. The fourth stage is the Agate Basin Plano complex (5500 B.C. to 3000 B.C.). It is typified by points with Plains affiliation. Following this, at 2500 - 1500 B.C., a new blade-core technology appears in the Julian complex. Microblade cores, medium lanceolate points, corner and side-notched points, and large core tools are all typical of this complex. A similar blade-core technology continues through the Pointed Mountain complex (1500 - 1000 B.C.). A Plains influence is seen once again as Oxbow points appear during the Fish Lake complex (1000 - 700 B.C.). By 300 B.C. the blade-core technology has all but disappeared as the Mackenzie complex (300 B.C. to 500 A.D.) is established. Finally, the Spence River complex (500 - 1800 A.D.) with its small side-notched points, appears and lasts until historic times.

Further to the east, in the area of Great Slave Lake, William C. Noble (1971) has proposed a chronological-cultural sequence which extends to approximately 7,000 years ago. The dates of these traditions and complexes are based on radiocarbon dates and relative beachline chronologies. The initial settlement of the area is defined by the Agate Basin points found in the Acasta Lake complex (5000 B.C.). Most of these points are ground on the lateral margins of their bases and stems. Unipointed and bipointed bifaces; humped-backed, spall, and stemmed scrapers; scraper-planes; semilunar, bifacial knives; retouched flakes; twist drills; multigravers; and spokeshaves also occur. An apparent cultural discontinuity exists for the period 4500 - 3000 B.C., although this may be indicative of a sampling error of materials from that time (Noble 1971: 106). The next identifiable culture is the Artillery Lake complex (3000 - 2500 B.C.), in which long narrow lanceolate points; linear bifaces; small discoidal thumbnail end-scrapers; and choppers comprise the artifact assemblage. The succeeding Oxbow complex (2500 - 1500 B.C.) is characterized by Oxbow type projectile points; thumbnail end-scrapers; and the base of a knife. This complex did not extend far north of the southeastern end of Great Slave Lake. Following this is the Caribou Island complex (between 1500 to 1000 B.C.) with distinctively stemmed, bifurcate points and the Pelican Lake complex (0 - 200 A.D.) with its typical point type.

Four complexes, identified as belonging to the Canadian Tundra tradition (1200 - 200 B.C.), have been considered to be regional variations of the more extensive Arctic Small Tool tradition. The first of these is the Rocknest Lake complex (1200 - 900 B.C.) which is characterized by small triangular points made of white chert; snubnose and flake scrapers and beaked scrapers. The distinctive projectile points continue into the Aurora River complex (900 - 700 B.C.), as do the scraper types. Blades continue to be poorly manufactured and burins, though rare, are distinctive. In the third complex, the Timber Point complex (700 - 400 B.C.), irregular points with concave bases are replaced by small, concave-based side-notched points. Short lanceolates continue from the preceding complex. In addition to the scrapers previously found, an "eared" variety of end-scraper appears. Chert microblades appear and flourish, and burins become more frequent. The final Arctic Small Tool manifestation is the MacKinlay River complex (400 - 200 B.C.). Narrow, stemmed quartzite lanceolate points supplant former styles and microblades disappear in favour of crude blade-like flakes.

The settlement of this region by Athapaskan-speaking people is reflected in the Taltheilei Shale tradition. This tradition begins with the Hennessey complex (200 B.C. - 100 A.D.) which is typified by an unground, wide, stemmed lanceolate point; snubnose and flake scrapers; oval, linear, and small oval bifaces; circular chi-thos; knives; blade-like flakes; bipolar hammerstones; and wedges. In the succeeding Taltheilei complex (100 - 300 A.D.) the stemmed projectile points increase in size to form Taltheilei lanceolates. Hennessey and MacKinlay varieties of points continue in addition to a straight-sided lanceolate style with thinned bases and slight grinding along lateral basal margins. Snubnose, thumbnail, and flake scrapers; oval and pointed bifaces; slate knives; and blade-like flakes also continue.

Grinding of stem margins of projectile points disappears in the Windy Point complex (300 - 500 A.D.), although the shorter, straight-to-slightly contracting stem point style continues and an unground, round-base lanceolate form appears. This latter style continues through the Waldron River complex (500 - 900 A.D.) when an unground, narrow lanceolate appears. In the Narrows complex (900 - 1100 A.D.) the points become slightly tapered, unground lanceolates with straight bases. These continue to be found in the Lockhart River complex (1100 - 1300 A.D.). In addition, corner-removed and side-notched points appear for the first time and small, stemmed varieties may be found occasionally. Scraper and biface forms resemble those found in other complexes of this tradition. In the Frank Channel complex (1300 - 1500 A.D.) short, narrow, stemmed points and a stubby triangular variety are found in addition to the styles found in the preceding complex. The corner-removed and small stemmed points disappear in the Fairchild Bay complex (1500 - 1700 A.D.), although the straight-sided lanceolates and small side-notched points continue. The Snare River complex (1700 - 1770 A.D.) may be identified by the presence of small, side-notched points and long, slender lanceolates. Finally, in the Reliance complex (1770 - 1840 A.D.) artifacts which reflect earlier influences (such as small side-notched points) become mixed with European trade items such as glass beads and clay pipe fragments. The scraper, biface and knife forms typical of other complexes in the Taltheilei tradition continue to be found throughout this final stage.

Elements of the Taltheilei tradition have been widely noted throughout the Northwest Territories. In addition to the studies previously noted, Irving (1968), McGhee (1970), Wright (1972), Clark (1975), and Gordon (1975, 1976a, 1976c) have all recorded instances of this culture group. At the Sandwillow site, projectile points with straight and tapered, lightly ground stems, and ground bases were found (McGhee 1970: 60). In the same vicinity large lanceolate points with straight, slightly concave, thinned bases and convex lateral edges which are ground near the base were recorded at the Lapoint site.

An account of the Aberdeen site, located at the confluence of the Thelon River and Aberdeen Lake, suggests that the Taltheilei tradition was present for nearly two thousand years.

> Taltheilei Shale tradition projectile point varieties present on the Aberdeen site equate with the Hennessey, Windy Point, Narrows and Frank Channel complexes of the tradition and a time range of 0 A.D. to late prehistoric or even early historic is estimated for these materials. (Wright 1972: 83)

Occupation of this area by Athapaskan-speaking peoples ended just after the time of white contact when the Caribou Eskimo supplanted the Indians. Gordon (1975: 98) has extended the presence of the Hennessey complex to the region of the upper Thelon River. Radiocarbon samples which were associated with one Hennessey point have yielded dates of 405 ± 80 B.C.: 2,335 ± 80 B.P. and 490 ± 120 B.C.: 2,440 ± 120 B.P. These dates are earlier than those proposed by Noble.

A positive relationship apparently existed between the distribution of selected material types and cultural groups (Clark 1975: 62). From the sequence developed by Noble (1971), it is evident that the Arctic Small Tool artifacts of the Canadian Tundra tradition were fashioned from a distinctive variety of chert, while the Taltheilei people primarily used a grey silicious shale found near Great Slave Lake.

In other areas quartzite and chert were used in the manufacture of tools related to this tradition (McGhee 1970; Wright 1972, 1975; Minni 1975; Nash 1975). Further to the west, the Fisherman Lake assemblages are made primarily of grey-black chert or argillite, welded tuff, and obsidian. Within Alberta, the Beaver Creek site (Syncrude 1974) has been identified as the quarry for a distinctive fine-grained quartzite. Work in the Saddle Hills (Thomson 1973) revealed a preference for black chert over locally available quartzite. The Liard River in British Columbia and the Red River near Fort Vermilion are indicated as possible source areas. Black chert is also preferred over quartzite in the Karpinsky material, although it has been suggested that this chert is actually a fine-grained basalt (Donahue 1976). The origin of this material is disputed. While Donahue feels that it may be from British Columbia, other evidence indicates that it may have been glacially transported (Bryan and Conaty 1975: 70). The selection for preferred materials does, indeed, seem to be of cultural importance and may aid greatly in the delineation of culture-chronologies.

The foregoing summary of northern archaeological research provides a basis for constructing a hypothetical culture sequence for the Caribou Mountains. The initial phase of such a chronology would consist of a Palaeo-Indian period. This, most probably, would be exemplified by points resembling Agate Basin or side-notched Acasta points. It may be termed the Acasta Lake complex and is a part of the more generalized northern Plano tradition. The appearance of this tradition may be tentatively dated at between 6500 and 5000 B.C.

A Plains influence should be expected during the period 2500 B.C. to 200 B.C. Elements from the Oxbow complex, the Caribou Island complex and the Pelican Lake complex reflect brief, possibly seasonal, excursions of Plains oriented hunters into the northern forests. This appearance of southern cultural influences is significantly late, given the ca. 3000 B.C. date for Oxbow material on the Plains.

The Arctic Small Tool tradition has been placed in the approximate period 1000 - 200 B.C., thus overlapping the Plains material. Occurrences of this Barrenground culture become increasingly sparse as one moves further into the Boreal Forest. Thus, while it is important in the Keewatin (Gordon 1975; Nash 1975) at Great Slave Lake (Noble 1971) and at Black Lake (Minni 1975), it is considerably less evident at Lake Athabasca (Wright 1975). Given this general trend, it is doubtful if the Arctic Small Tool tradition ever extended into the Caribou Mountains.

By 200 B.C. the Athapaskan-related Taltheilei tradition had become a major feature in the northern forests of western North America. Beginning with the Hennessey complex, this tradition reveals a gradual shift from long, stemmed points, through smaller side-notched varieties, to historic materials. These complexes are the remnants of Indian peoples who, in historic times, were the unspecialized hunters and gatherers of the Boreal Forest.

5. METHODOLOGY

Wentzel Lake site was situated in the crescentric embayment at the southeast end of Wentzel Lake (50° 58" 59' N lat. x 114° 25' 30" W long.; SE SE S16 & SW SW S15 T115 R3 W5). The old beach terrace upon which the site was located was approximately 370 m from east to west and 40 m from north to south (Figure 2; Plate 1). The western boundary was delineated by a stream which flowed into the lake from an area of higher elevation to the south. Near the eastern end of this terrace a small ridge marked the boundary between the site and the bog area to the south. This ridge curved north and east, reducing the width of the terrace and forming the eastern boundary of the site. An intermittent stream, which entered the lake at the eastern extremity of this embayment, flowed from a small pond located to the southeast. The site area was separated from the lake by a narrow, sandy beach.

Upon locating the site in 1975, Donahue (1976) excavated ten 1 m^2 test pits. Eight of these were near the northern edge of the terrace, while the remaining two were located on the higher, rear portion. Although no finished tools were recovered from the site, the stratigraphy was exposed and charcoal samples for radiocarbon assays were retrieved. The four dates derived from these samples ranged from 1,440 ± 100 B.P.: 510 ± 100 A.D. to 5,220 ± 140 B.P.: 3270 ± B.C. and were all associated with strata containing cultural material. These dates provided temporal brackets for the various occupations. It was assumed that the absence of finished artifacts was due to a sampling error and did not reflect the actual situation (Donahue 1976: 37).

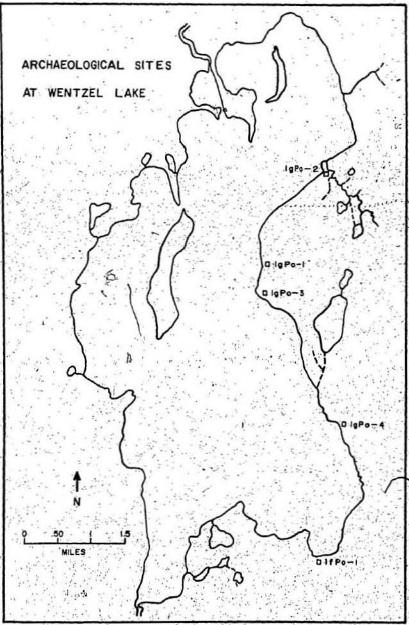

ARCHAEOLOGICAL SITES
AT WENTZEL LAKE
IgPo-2
IgPo-1
IgPo-3
IgPo-4
IfPo-1
N
0
.50
1
1.5
MILES

FIGURE 2

Plate 1. View of Wentzel Lake site looking west.

Three objectives were established at the outset of the current study. The first was to determine the boundaries of the site as indicated by the distribution of the artifacts. The second aim was the delineation of the various activity areas on the basis of the differential distribution of artifacts. Any diachronic change in the pattern of site utilization would be of potential significance in discussing the culture history of the site. The third objective was to establish the sequence of cultural developments at this locality. Although the radiocarbon dates indicated a relatively early date of initial occupation, there was no diagnostic material to indicate the cultural affiliation at that time. Any excavation strategy to be employed here had to possess the potential for recovering data which would facilitate meeting these goals.

The excavation of a stratified site provides the archaeologist with the opportunity to directly analyze the effects of culture processes as they are manifest in the culture history of the site. One is dealing with what has been termed diachronic anthropology, or:

> ... the study of temporal variability in human behavior and the products of that behavior. Diachronic anthropology may be contrasted with synchronic anthropology, the study of spatial variability in human behavior and its products. Thus, diachronic anthropology refers primarily to a data base -- cultural and behavioral variability in time. (Plog 1973: 181)

The implication that the archaeologist is concerned with culture, necessitates his recognition that the artifact and the depositional framework in which it is found are by-products of human activity. As such, there is a vastly complex system which contributes to the situation as it is perceived by the archaeologist. The occurrence of a particular style of artifact may be the result of natural depositional factors, removal from its place of origin and subsequent loss by a later group, or breakage during the period of original use. It is therefore important, as Brown (1975) notes, that the comparison between strata in a site be concerned with data of the same class. To this end, it is important that similar activity areas be compared rather than merely the artifacts.

In view of the impossibility of excavating the entire site, it was acknowledged that a sampling strategy would have to be adopted which would permit significant interpretations of the recovered data. The universe from which the sample was taken may be defined as the site:

> The sampling universe for the investigation of populations of cultural items is necessarily the site. The sampling and field observation procedures utilized do not affect our ability to analyze items formally, but they greatly affect our ability to study the distribution, form, and structure of a population of cultural items. It will be remembered that a population necessarily has spatial attributes both in its distribution and structure. Sampling control is therefore necessary to provide data for the description of populations of cultural elements. (Binford 1964: 430)

To consider the entire site as a single universe, however, would mean that the archaeologist must assume a sufficiently high degree of homogeneity in the distribution of the artifacts (Chenall 1975: 10). Alternatively, the sampling universe may be partitioned in an effort to decrease the heterogeneity of the populations. This procedure is known as stratified sampling (Binford 1964). Implicit in this design, however, is the assumption that "... all locations within the sampling be truly accessible and that the limits of occupations composing the site are known." (Brown 1975: 158). In a stratified site various components may not be present throughout the entire locale. This means that the entire universe may not be accessible to the investigator. This contradicts the probabilistic nature of most sampling designs.

James A. Brown has devised a five step procedure for sampling deeply stratified sites based on his experience at the Koster site in south-central Illinois. The stages involved are:

> ... 1) The collection of information relevant to the number, depth and extent of the subsurface archaeological zones within the site limits;
>
> 2) The creation of a first-order sample stratification of the site sample space;
>
> 3) The excavation of the set of sample excavation units;
>
> 4) The classification of sample units for each layer to recover activity categories; and
>
> 5) The expansion of excavation as a result of creating a second-order sample to improve on the representation of activity types in each layer. (Brown 1975: 169)

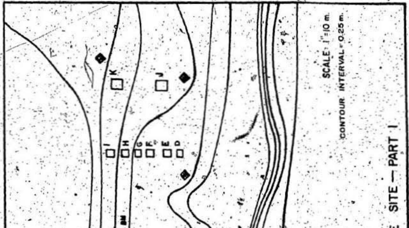
This approach attempts to overcome the difficulty of obtaining data which is truly indicative of culture change. If the materials from different components are to be meaningfully compared it is important that these data reflect similar activities. The delineation of a unique phenomenon is of limited archaeological value unless it can be related to the pattern of activities. At the basis of this approach is the explicit assumption of the multidimensional model which "... recognizes that assemblages are compounds of the variable expression of many independent dimensions." (Brown 1975: 161). With these factors in mind, a modified version of the strategy outlined above was adopted in the present study.

The first step, that of identifying the number, extent, and depth of various strata, was aided by an examination of a composite profile drawn from the previous summer's excavations (Donahue 1976: personal communication). As those units represented primarily the more northerly portion of the site, it was felt that a series of test pits transecting the site on a north-south axis would be beneficial in exposing the depositional configuration. Three such series were proposed such that the stratigraphy could also be correlated from east to west. The initial transect was composed of three 2 m^2 units placed at intervals of 2 m (Figure 3). This approach was a compromise between the desire to maximize the total sample area and the need to expose a sufficient stratigraphic section from north to south. Unfortunately, the interval between units proved to be too great to allow accurate stratigraphic correlations.

A second series of test units was then aligned along a north-south line at a distance of 20 m west of the initial transect. This group was composed of six 1 m^2 units which were separated by 1 m intervals (Plate 2; Figure 3). With a smaller space between exposed sections, it became easier to identify the stratigraphic components.

The area excavated in the second group of test pits was one-half (6 m^2) that of the first group (12 m^2). Furthermore, the zones which were unexcavated in the first series (i.e. between units A and B, and units B and C) were still under-represented in the compiled data. To correct this discrepancy, two 2 m^2 units were excavated 10 m west of series D-I (Figure 3). The stratigraphy of these units was then related to that of the other two series.

Plate 2. Aerial view of units D - I.

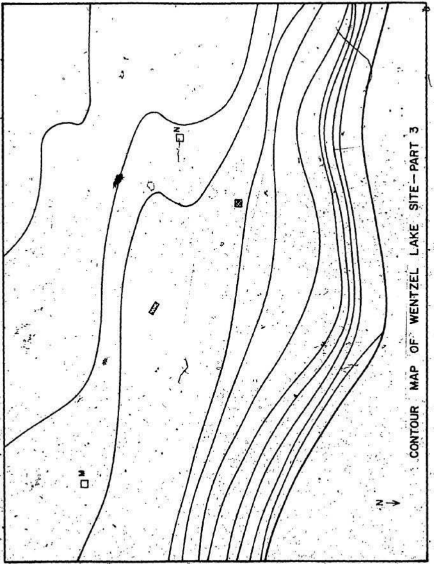


CONTOUR MAP OF WENTZEL LAKE SITE — PART I

FIGURE 3

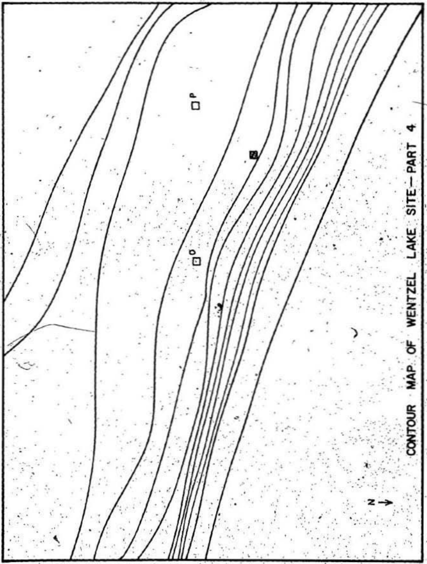
CONTOUR MAP OF WENTZEL LAKE SITE — PART 2.

FIGURE 4



CONTOUR MAP OF WENTZEL LAKE SITE-PART 3

FIGURE 5



CONTOUR MAP OF WENTZEL LAKE SITE — PART 4

FIGURE 6

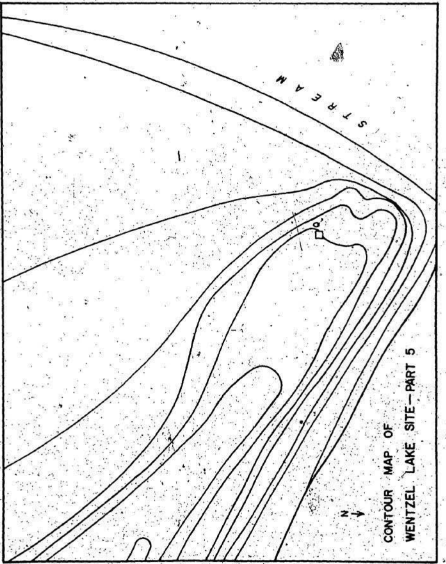


FIGURE 7

Having thus established the stratigraphic sequence for the site and intensively sampled the eastern extremity of the accessible area, our attention was directed toward sampling the remainder of the site. Field notes from the previous season (Donahue personal communication) had indicated that the recovery rate of lithic material had diminished rapidly as one proceeded from the eastern to the western end of the site. As the current excavations proceeded, a similar trend was noted. This was further emphasized by a very marked decrease in the occurrence of finished tools in the more westerly units. On the basis of this trend it was decided to sample the remainder of the site by excavating a number of 1 m^2 units which were set at irregular intervals.

A number of factors contributed to the decision of where to locate these test pits. A major concern was still the correlation of stratigraphy. However, additional emphasis was placed on the sampling of those areas which had not been previously tested. Units L through Q comprise this sample. The larger area between units N and O (Figures 4, 5) was a sedge bog and was, therefore, not tested.

As a result of this sampling strategy, the stratigraphy and the vertical and horizontal boundaries of the site were defined. In addition, the correlation of the strata facilitated the delineation of cultural components. However, given the nature of the artifact material, the identification of activity areas was less successful.

6. STRATIGRAPHY

INTRODUCTION

The Wentzel Lake site is situated on a bench which slopes north-south from 25 cm to 1.5 m above the level of the lake. The biotic succession on this bench has not proceeded beyond the earliest seres. Soil development is, consequently, poor with the Ah horizon being restricted to a narrow (ca. 2.0-4.0 cm) band of dark brown soil. The underlying strata is divisible into cultural and non-cultural levels, with each level being identified on the basis of colour and texture (Table 5). The vertical extent of these horizons varies greatly within the site. In some portions units were excavated to a depth of 100 cm with no indication that the sequence would be interrupted, while in other areas a basal configuration of glacially deposited gravel was reached between 40 and 60 cm below the surface.

The discussion of the cultural strata includes a description and correlation of each level across the entire site. A different approach was taken toward the non-cultural levels as these strata appear to be more closely related to the position of the excavation unit relative to the active beach. The units near the present beach revealed layers of interbedded sand while the strata of those further away comprised glacially deposited gravel. The detailed description of these levels illustrates the correlation between the various locales on the site and the configuration of the basal strata. By considering the current depositional pattern as representative of past conditions, it is possible to extrapolate the areas of prehistoric activity.

TABLE 5 STRATIGRAPHIC COMPONENTS

LEVEL	DESCRIPTION	REFERENCE
Forest Litter	Lichen and mosses	
Ia	Pale yellow sand	
Ib	Light grey sandy soil	
IIa	Light yellow sand with closely banded charcoal	
IIb	Pale yellow sand	
III	Coarse reddish brown sand	
IV	Yellow sand with intermittently banded charcoal	
Va	Sterile yellow sand with interbedding	

TABLE 5 (cont.) STRATIGRAPHIC COMPONENTS

LEVEL	DESCRIPTION	REFERENCE
Vb	Sterile sand with pea gravel	
VI	Sterile coarse reddish brown sand	
VII	Unsorted gravel	
VIII	Reddish brown hardpan	
IX	Red stain	
Charcoal stain		

STRATIGRAPHIC DESCRIPTIONS: CULTURAL LEVELS

Forest Litter

The surface level throughout the site consisted of a lichen and moss root mat which extended from 2 to 5 cm below the surface.

Level Ia

This level, a layer of pale yellow sand lying immediately beneath the root mat, was found in units A, D, E, F, H, P, and Q. In units E and H it appeared as a very thin (2-3 cm) lens, while in unit P it was almost 10 cm thick. The fineness of the material indicated that this may have been a deposit of windblown sand which had been irregularly deposited.

Level Ib

This stratum was composed of light grey sandy soil. It was the only one of the three major culture-bearing layers that was represented throughout the entire site. The mean thickness of this level was 16.5 cm (maximum: 25 cm, unit O; minimum: 2cm, unit F). Charcoal banding, although present, was very indistinct and generally was evident only as a darkening of the soil.

Level IIa

The next major cultural stratum beneath level Ib was a layer of light yellow sand with closely banded charcoal, designated as level IIa. Unlike level Ib, this level did not occur universally throughout the excavated portion of the site. It was absent from units C and Q, and occurred only as a thin lens in units I and K. Elsewhere, it was most pronounced in unit J (38 cm wide) and narrowest in unit O (10 cm wide). On the average, however, it was of moderate thickness (mean: 13.6 cm).

Level IIb

This level was described as a discontinuous stratum of pale yellow sand. In units E, N, P and Q it occurred as an interrupted band or a series of lenses at the bottom of level Ib. The mean width was 5.4 cm (maximum: 9 cm, unit E; minimum: 2 cm, unit N). Alternatively, in units G and P, there was a distinct band of this stratum with a mean width of 5.3 cm (maximum: 7 cm, unit P; minimum: 2 cm, unit G) which separated levels Ib and IIa. In units E and F a lens of this stratum occurred at the bottom of level IIa. Here the mean thickness was 3.2 cm (maximum: 3.3 cm, unit E; Minimum: 3.0 cm, unit F).

Level III

This was a poorly defined stratum of coarse reddish-brown sand which occurred only in units A, J and K. The mean thickness of the level was 5.4 cm (maximum: 10 cm, unit J; minimum: 2 cm, units A and K). In no instance did this material form a continuous band. Rather, it occurred in the form of lenses which extended for an average of 77.7 cm across the walls of each of these 2 m^2 units.

Level IV

The thickest culture-bearing deposit was composed of yellow sand with intermittently occurring bands of charcoal. As such, it closely resembled level IIa so that the boundaries between these two strata were not always distinct. Level IV occurred as a continuous level in every unit except J, M and P. In unit J it occurred as two separate lenses, one 11.5 cm thick by 52 cm long and the other 10 cm thick and

15 cm long. This level was not present in units M and P. In addition to being the thickest cultural deposit, this also represented the lowest level at which artifacts were found. In many cases the archaeological deposits were exhausted before the maximum extent of this level was reached.

STRATIGRAPHIC DESCRIPTIONS: STERILE LEVELS

The basal levels of the stratigraphy were indicative of the position of the excavated units relative to the slope of the land. These levels reflected, even more than the upper strata, the configurations of the beach throughout time. The description of these lower strata was facilitated by taking a "block" approach to the site. Units A, B and C formed Block 1, units D through I formed Block 2, and units J and K formed Block 3. Each block represented a stratigraphic exposure from north to south through the beach terrace. The sterile strata consisted of: level Va, yellow sand with interbedding; level Vb, pea gravel in sand matrix; level VI, coarse reddish-brown sand; level VII, unsorted gravel; and level VIII, reddish-brown hardpan.

Block 1

Unit A was the most beachward excavation of this series. The lowest cultural deposit, level IV, was directly underlain by sterile yellow sand with interbedding (level Va). This comprised the basal unit in all but the southeast quarter of the unit where a small, lenticular exposure of sterile coarse, reddish-brown sand (level VI) occurred within 10 cm of the bottom (Figure 8, Plate 3).

Figure 8 — Profile East Wall Unit A

10 5 0 10 20 30 40 cm

Plate 3. Profile, west wall of unit A.

The intermediate member of this block, unit B, did not possess the cultural level IV. Rather, a deposit of sterile reddish-brown hardpan underlay level IIa. This thick (30 cm) stratum was apparently composed of ferrous sesquioxides which had been leached from the upper horizons. Below this level VIII lay unsorted gravels of indeterminate depth (level VII).

The most southerly unit of Block 1 also had a very simple stratigraphy. Immediately below the last cultural layer (level IV) unsorted gravels were encountered. When the southeast quarter of this unit was excavated to a depth of 100 cm below the surface, it was discovered that this gravel was continuous to a depth of approximately 90 cm. At that point, pea gravel in a matrix of yellow sand (level Vb) became evident.

Block 2

The second block of units was divided into a beachward section (D, E and F), a central section (G and H), and a southward section (I) which exposed the sediments on the highest part of the beach terrace. The beachward units had very similar stratigraphy. In units D and E, the cultural levels were underlain by level Va (Figure 9). Unit F (Figure 10) showed a slight variation, wherein level VI (coarse, reddish-brown sand) formed the bottom stratum.

The middle units of Block 2 manifested quite dissimilar basal stratigraphies. In unit G (Figure 10) the culture-bearing material was directly underlain by unsorted gravels (level VII). At the level to which this unit was excavated (80 cm below the surface), this gravel formed the floor in the northern half of the pit only. In the southern

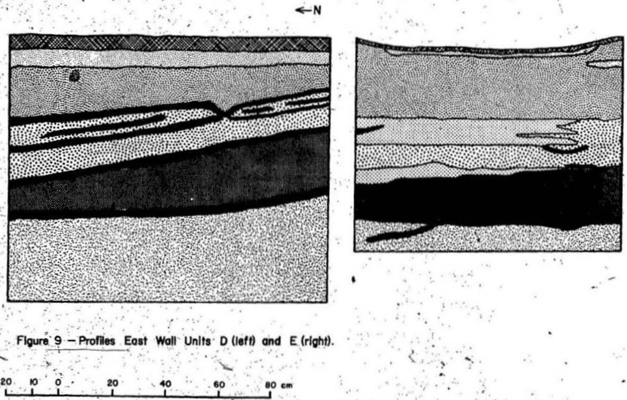


Figure 9 – Profiles East Wall Units D (left) and E (right).

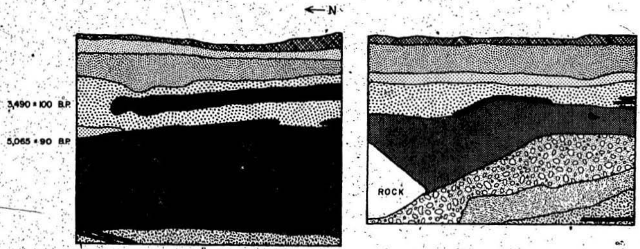
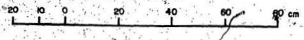


Figure 10 — Profiles East Wall Units F (left) and G (right).



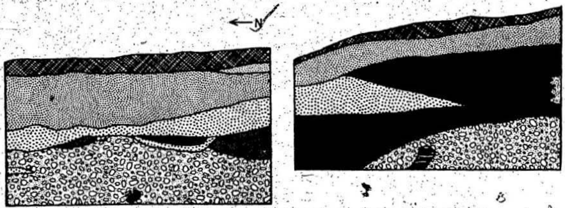
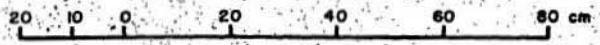


Figure 11.—Profiles East Wall Units H (left) and I (right).



half, the gravel was superimposed on a layer of pea gravel in a yellow sand matrix (level Vb) which was approximately 10 cm thick. This pea gravel was, in turn, underlain by a thin (5 cm thick) lens of coarse, reddish-brown sand designated as level VI.

Unit I presented approximately the same stratigraphic configuration as unit H. Throughout almost the entire unit unsorted gravels underlay level IV. The exception to this occurred in the northwest quarter where the excavations did not proceed beyond the cultural horizon (Figure 11). This stratum had proved to be void of artifacts for some depth. Also within this quarter, a small intrusive lens of coarse, reddish-brown sand (level VI) was observed.

Block 3

Most of unit J was not excavated below level IV. As much of the lower portion of this stratum was sterile, it is doubtful that any cultural material was overlooked. In the north half of this unit the excavation was continued to a deeper level. It was here that a horizon of level VIII (reddish-brown hardpan) first manifested itself.

In a more southerly position, unit K provided a profile which was very similar to those of units C, H and I. That is, the lowermost cultural deposits were underlain by the unsorted gravels of level VII.

Unit L

The non-cultural stratigraphy of this unit consisted entirely of level Va. This interbedded yellow sand formed a broad horizon, extending from 20 cm below the surface to the bottom of the unit, at 80 cm below the surface. It correlated well to units A, D and E and was indicative of the close proximity to the lake.

Unit M

Beneath level IV of this unit was a layer of interbedded yellow sand, designated as level Va. This stratum was correlated with counterparts in units A, D, E and L. The stratigraphy of unit M differed from these four in that this first layer of sterile material was underlain by a horizon of reddish-brown hardpan. This occurrence of level VIII first became evident in the southern portion of the unit at a depth of 45 cm below the surface. This stratum was not in evidence across the entire profile.

The occurrence of leached ferrous sesquioxides as a basal stratum was attributed to the location of unit M in a flat, marshy area where grasses were an important constituent of the ground cover. It was easy to account for the presence of level Vb, a stratum which has been discussed in terms of proximity to the lake. Unit M, unlike pits to the west which lay at a similar distance from the current beach, was not situated on an incline. Consequently, the sterile sand of level Vb may have had a better chance to accumulate before either compaction or erosion diminished the sediment.

Unit N

Sterile beach deposits did not occur in unit N. The lowermost cultural deposit, level IV, was underlain by a reddish-brown hardpan of leached ferrous sesquioxides (level VIII). This occurred as a thin (2 cm wide) basal stratum in the northern quarter of the unit, but expanded to a width of 10 cm in the central portion. The expansion tapered to a narrow, 5 cm wide band in the southern quarter where a layer of unsorted gravel 15 cm thick was exposed beneath it.

Unit N was located in the western portion of the same low, marshy area where unit M was excavated. Although unit N was positioned more lakeward than unit M, this marshy area became more pronounced as one approached the western extremity. As a result of an increased leaching in this area, the beach deposits represented by level Va became less obvious (being supplanted by level VIII).

Unit O

This unit was located very near the current beach area in the western portion of the site. Although there was a very thick deposit of level IV, the lower portion of that stratum was sterile. Below it lay a horizon of coarse, reddish-brown sand which was also sterile. This layer, designated as level VI, varied from between 5 cm to 10 cm in thickness.

The stratigraphy of unit O compared favourably to that of unit F, in that the basal strata were represented solely by level VI. In view of the proximity to the lake of unit O, one would have expected a greater similarity between this and units A, D or E. The absence of interbedded yellow sand so close to the current beach may have been related to the differential deposition of humic material and sand types as a function of wave action and micro-environmental factors.

Unit P

Three levels formed the basal strata of this unit. Immediately below the cultural deposits was a broad (15 cm thick) layer of coarse reddish-brown sand. Below this level VI lay the reddish-brown hardpan of level VIII. This latter level extended from a depth of 50 cm below the surface almost to the bottom of the unit. Pea gravel (level Vb) was expesed at approximately 78 cm below the surface, but as the unit was only excavated to a depth of 80 cm below the surface the complete extent of this deposit was not discovered.

In comparing unit P with the other units several anomalies became apparent. Elsewhere, level VI occurred only as a thin layer at the bottom of the stratigraphic column. In unit P it was adjacent to the cultural material and was almost 20 cm thick. The underlying level VII was also uncharacteristically thick (approximately 30 cm) although it occurred as a 20 to 30 cm interval in unit B. In all probability, the location of unit P on the western periphery of the flat marshy area led to the development of this unique stratigraphy.

Unit Q

Located at the extreme western end of the site, the basal stratigraphy of this unit was composed entirely of interbedded yellow sand (level VI). It resembled the lower portion of units A, D and E. This similarity was not surprising as unit Q was situated on the side of a small sandy knoll near the point where the stream entered the lake. The exposed nature of this locale had inhibited the development of extensive ground cover. Consequently, the leaching of materials was reduced to a minimum. In addition, the ridge which bounded the side to the south in the eastern portion was not in existence at the western end. As a result, the underlying unsorted gravels which were exposed in units B, C, G, H, I and K were not in evidence in unit Q.

DISCUSSION

An examination of the beach which was currently being deposited aided in the understanding of some of the stratigraphic phenomena which occurred at this site. Black organic matter was continually being washed ashore and deposited in long, narrow bands near the water's edge. The amount of material deposited varied with the velocity and direction of the wind (the wind having a major influence on wave action). This material was being redistributed so that over 5 cm, which was deposited during one lengthy storm, had all but disappeared within one week. A comparison of the dark "charcoal" bands in the profiles and the organic beach deposits revealed that they were, indeed, very similar materials. Throughout the excavations it became evident that the charcoal bands were distributed in a discontinuous configuration across the floor of each unit. This resembled the pattern of charcoal on the current beach.

As the charcoal bands proved to be an unsatisfactory means of separating the stratigraphic levels, the colour and texture of the various sand layers were analyzed. The present beach was again examined in an attempt to understand the processes which had resulted in deposition of the old beach. Although seemingly composed of a uniformally coloured and textured sand, the current beach was an interbedded complex of coarse and fine grained materials ranging in colour from pale yellow to very pale brown. Thus, the storm action had resulted in a great intermixture that was only somewhat alleviated by the sorting action of the normal waves. Within the site this was reflected in the interbedding and mottling which occurred in some strata.

The unsorted gravels and pea gravels which formed the substrata in several units were glacially deposited sediments. Their occurrence in units B, C, G, H, I and K reflected the proximity of these units to a ridge along the southern border of the site. The interface of these gravels with the sterile sands of levels Va, VI, and VII indicated that the first beach was deposited after glaciation.

FEATURES

The excavation revealed two features, both of which appeared to be hearths. One of these occurred in unit C within level IV. This consisted of 7 quartzite stones arrayed in a circle 95 cm long (north-south) by 88 cm wide (east-west) by approximately 10 cm thick. Burnt organic matter and numerous flakes, one of which exhibited a pot-lid fracture, were associated with this feature.

A second hearth was found in unit F in level IIa. A thick lens of charcoal covering approximately one-quarter of the unit comprised this feature. The occurrence of charcoal in thick lumps, some of which exhibited wood grain, was in contrast to the usual appearance of charcoal at this site. This, together with the presence of numerous annealed flakes in and around this charcoal, indicated that this may have been a hearth. A charcoal sample from this feature (S-1243) was submitted for C-14 assay.

DATING

Four charcoal samples, two from unit A and two from unit F, were submitted for radiocarbon assay. Three of the samples were composed of organic material that had probably been deposited on old beaches as lake-washed debris. A fourth sample, consisting of a charred wood fragment, was initially believed to be a more reliable material for dating purposes. However, the sequence of dates indicates that the organic material may be considerably more consistant than was first thought. A comparison of the sequence of dates presented here with those derived from Donahue's (1976) earlier study indicates that the two series are, essentially, the same. The dates provided are, therefore, considered to be indicative of the time at which the various strata were deposited.

One sample, which yielded a date of 4,765 $\pm$ 85 B.P.: 2806 $\pm$ 85 B.C. (S-1245), was taken from near the top of level Va in unit A. Although this level was sterile throughout most of the site and the artifacts which did occur within it were considered to be intrusive, this date provides a significant index for the maximum period of occupation of the site. That is, no cultural occupation occurred prior to ca. 4,800 B.P., and was probably initiated several hundred years later. A second radiocarbon date, also from unit A (Fig. 8) provides both a minimum age limit for level IV and a maximum age limit for the inhabitants of level IIb.

The two dates from unit A are indicative of some of the stratigraphic problems encountered in beach deposits. While the vertical proximity of dates with a one thousand year interval may have resulted from the rapid accumulation of deposits, a similarily rapid erosion may have been the primary factor. It will be noted that the older date was derived from a sample located near the southern (landward) end of the unit, while the younger sample was obtained from the northern (lakeward) quarter. It is likely that wave action continued to erode the latter area after stable deposits had begun to build up farther away from the lake. Consequently, the older deposits in the northern quarter were continually washed away and replaced with younger deposits. Such a depositional sequence greatly impairs any computation of the time required to deposit a given amount of sediment.

Two charcoal samples retrieved from unit F (Fig. 10) were associated with lithic debris. One sample, which consisted of burnt wood fragments, was dated 5,065 ± 90 B.P.: 3115 ± 90 B.C. (S-1243). Annealed chert flakes and flakes with pot-lid fractures were associated with the dated charcoal which lay at the interface of level IIb and level IV. The other sample, dated 3,490 ± 100 B.P.: 1540 ± B.C. (S-1242) was associated with a concentration of grey chert flakes in level IIa. Humic matter obtained from a broad, continuous band comprised the dated material.

The sample which dated 5,065 ± 90 B.P. is enigmatic in that it occurred near the top of level IV, above a younger date from level IV (4,765 ± 85 B.P.). Several factors indicate that this sample was taken from a cultural feature: the numerous annealed flakes and flakes with pot-lid fractures that were associated with the charcoal; the fact that the sample was burnt wood and not organic lake flotsam; and the depression-like configuration of the charcoal banding (Fig. 10). If this feature is, indeed, a hearth then the date may represent a situation which is analogous to many sites in the Canadian Arctic. There, it has been recognized that radiocarbon assays on samples of burnt driftwood may yield dates which are substantially older than the "real" age of the associated cultural component (cf. Tuck and McGhee 1976). Given the edaphic conditions indicated in the stratigraphic profiles, the current sparse arboreal population may have extended back in time. In contrast, a relatively abundant supply of driftwood may have been easily accessible to any band of hunters and gathers who frequented the site. Post-depositional contamination may have further increased the error of the date.

7. ARTIFACT ANALYSIS

The artifacts recovered from the Wentzel Lake site were analyzed with regard to two objectives. The first of these was the establishment of a cultural sequence for the site. Such a sequence would, hopefully, fit into the regional prehistoric scheme already outlined. The development of this sequence was facilitated by vertically plotting each tool, identifying the associated stratigraphic component, and describing the morphological characteristics of the piece. The second objective was to gain an insight into the cultural patternings reflected in the artifact distribution. Identification of activity areas was thus attempted through an analysis of the horizontal distribution of tools from each synchronous association. Flaking debitage was also analyzed with regard to the vertical and horizontal distribution of each material type. A list of material types is provided in Table 6.

ARTIFACT DESCRIPTION

The model followed in the classification of the tools was basically that devised by Morlan (1973) for his description of artifacts from the Yukon Territory. This approach had the advantage of emphasizing the technological aspects of the artifacts rather than the functional aspects. One was therefore able to work with more quantifiable metric data rather than information which was assumed or implied. Appendix I contains a complete inventory of the tools found at this site.

In the discussion of the stratigraphy of this site, it was noted that very little disturbance was in evidence. It seemed reasonable to assume, therefore that an examination of the vertical

TABLE 6. LITHIC TYPES FROM THE WENTZEL LAKE SITE.

1-A	Black chert
1-B	Blue-black chert
1-C	Grey chert
1-D	Grey translucent chert
1-E	Brown chert
1-F	Brown translucent chert
1-G	White chert
2	Red jasper
3	Basalt
4	Diorite
5	Quartz
6-A	Vitreous black quartzite
6-B	Vitreous grey quartzite
6-C	Vitreous brown quartzite
6-D	Vitreous white quartzite
7-A	Grey quartzite
7-B	Brown quartzite
7-C	White quartzite
7-D	Green quartzite
7-E	Pink quartzite
7-F	Red quartzite
7-G	Olive quartzite
7-H	Purple quartzite
7-I	Beaver Creek quartzite
8	Grey shale

distribution of the artifacts would be indicative of the chronology of the site occupation. Unfortunately, there existed the possibility that any given component may have contained artifacts from more than one cultural affiliate. Compaction of the levels, although probably a minor factor, may also have been responsible for cultural blending. Furthermore, not all of the artifacts could be placed conveniently in one strata or another, but rather were located in contiguous border areas. These have been designated "zones" and are accompanied by numerals indicating the bordering components.

Split Pebbles

These pebbles may have represented the initial phase of tool production. Evidence of flake removal (e.g. bulbs of percussion, rings and fissures) were generally absent. The fracture plane was determined by a number of variables, including fissures and faults within the rock, stone type, abrasion by water and ice, and the method of percussion. Although many members of this category exhibited only one line of breakage, shattering also occurred. The length, width and thickness of each piece was recorded as well as the stone type. The various shapes were also noted, although these may not be of any significance.

Material: Chert (2); Vitreous Quartzite (1); Quartzite (9)

Measurements:		mean	range
	length	40.35 mm	17.9 - 57.98 mm
	width	27.55 mm	12.65 - 54.55 mm
	thickness	23.16 mm	4.75 - 40.75 mm

Provenience: level IV (10); zone Ib-IV (1); zone Ia-IIb (1)

Core Fragments

These were pebbles from which numerous flakes had been removed. The scars which resulted from this flake removel distinguished these fragments from split pebbles. Identifiable platforms were not discernible on members of this category, thus consistent orientation for the purpose of measurement and description was not possible. Attributes recorded for these specimens were stone type, maximum linear measurements, and shape.

Material: Chert (1); Vitreous Quartzite (9); Quartzite (3)

Measurements:		mean	range
	length	31.32 mm	18.65 - 62.55 mm
	width	25.69 mm	10.9 - 35.25 mm
	thickness	19.38 mm	8.0 - 35.40 mm

Provenience: zone IIa-VIII (1); level IV (5); level IIb (1); level IIa (1); level Ib (5)

Microscopically Retouched Flakes

This group consisted of flakes with regular retouch which was impossible to observe without the aid of a microscope. The minuteness of the retouch scars prohibited their metric description.

Material: Chert (5); Vitreous Quartzite (10); Quartzite (1)

Measurements:		mean	range
	length	19.20 mm	10.0 - 28.6 mm
	width	17.32 mm	9.0 - 25.6 mm
	thickness	3.75 mm	1.7 - 6.3 mm
	length of retouch margin	mean: 13.0 mm	range: 1.03 - 20.5 mm

Provenience: level VIII (1); zone IIa-VIII (1);
level IV (2); zone IIa-IV (1); zone IIb-IV (2)
level IIa (6); zone Ib-IIa (1); level Ib (2)

Thinned Flakes

This type of macroscopically retouched flake was characterized by "... either continuous or discontinuous retouch scars which are either adjacent or overlapping, which may be of any length, and which lie at an angle of less than 45° to the unmodified face." (Morlan 1973: 18). Measurements taken were the length, width, and thickness of the flake and the angle and length of the modified margin(s) (Plates 4e, 5e, 6b, h, 7 a).

Material: Chert (2); Quartzite (5)

Measurements:

	mean	range
length	29.10 mm	15.95 - 49.60 mm
width	41.71 mm	11.10 - 73.00 mm
thickness	18.36 mm	4.60 - 39.50 mm

length of retouch margin — mean: 11.37 mm; range: 7.3 - 16.50 mm

angle of retouch scars — mean: 40.86°; range: 25° - 45°

length of retouch scars — mean: 2.49 mm; range: 0.9 - 10.55 mm

Provenience: level IV (2); level IIa (3); zone Ib-IIa (1);
level Ib (1)

Nicked Flakes

These unshaped flakes exhibited retouch scars which were discontinuous and/or adjacent at an angle of greater than 45° to the unmodified face. Determination of flake shaping was achieved by an examination of the rings, fissures, hinge fractures and platform remnants of ventral surface. These features were truncated on shaped flakes. Retouch scars on this tool type were generally less than 1 mm in length (Plates 4c, 5b, 7b, c).

Material: Chert (6)

Measurements:		mean	range
	length	20.25 mm	15.90 - 26.10 mm
	width	16.78 mm	9.80 - 29.80 mm
	thickness	3.89 mm	3.90 - 5.40 mm
	length of retouch margin	mean:	13.06 mm
		range:	3.04 - 17.90 mm
	angle of retouch scars	mean:	53.5°
		range:	45° - 65°

Provenience: level VIII (1); zone Ib-IV (1); level Ib (2)

Blunted Flakes

These flakes had continuous and/or overlapping retouch scars at an angle of greater than 45° to the unmodified face. The retouch margin could be described in geometric terms and the original shape of the flake remained unaltered. Again, retouch scars were generally less than 1 mm in length on these flakes (Plates 4c, d, 5c, 6a, f, 7d).

Material: Chert (6)

Measurements:	mean	range
length	24.98 mm	15.00 - 31.95 mm
width	20.38 mm	12.75 - 29.80 mm
thickness	5.38 mm	3.20 - 10.95 mm
length of retouch margin	mean: 18.32 mm	range: 1.75 - 29.35 mm
angle of retouch scars	mean: 65.14°	range: 55° - 76°

Provenience: level VIII (1); level IV (1); zone Ib-IV (1); level IIa (2); level Ib (1)

Bevelled Flakes

This category consisted of flakes which had been shaped along one or more margins. Retouch, while being primarily unifacial, was also found on opposite faces along different margins. Metrics recorded on these flakes were length, width, thickness, length of modified margin(s), average length of retouch scars, and the angle of the retouch scars against the unmodified margin (Plates 4a, b, 5a, 6c, d, e, g, 7e, f, g, h).

Material: Chert (7); Vitreous Quartzite (5)

Measurements:	mean	range
length	27.05 mm	20.40 - 43.35 mm
width	27.38 mm	16.00 - 47.95 mm
thickness	7.40 mm	4.10 - 16.15 mm
length of retouch margin	mean: 20.88 mm	range: 1.40 - 34.80 mm

angle of retouch scars mean: 68.52°
range: 45° - 85°

length of retouch scars mean: 4.08 mm
range: 0.4 - 9.0 mm

Unifaces

These included tools which exhibited extensive flaking on one surface. Only one such artifact was recovered (Plate 4j), and it was a fragment. The small amount of flaking that was observable consisted of broad, shallow flake scars which contributed to a scalloped effect along the edges.

Material: Quartzite

Measurements: length 13.00 mm
width 20.65 mm
thickness 7.00 mm

Provenience: level IV

Bifaces

Any tool which exhibited flaking and/or retouch on both surfaces along the same margin was classified as a biface. Members of this rather all-inclusive category were then subdivided according to their implied use. The four groupings which resulted were: bifacially retouched flakes (3); rough bifaces (1); finished bifaces (1); and projectile points (5).

Bifacially Retouched Flakes

These bifaces were generally not flaked across their entire surfaces. Rather, marginal retouch on both surfaces along one margin was noted (Plate 4f, 7i, j).

Material: Chert (2); Vitreous Quartzite (1)

Measurements:	mean	range
length	38.23 mm	28.1 - 45.8 mm
width	34.38 mm	14.8 - 46.65 mm
thickness	8.62 mm	2.7 - 14.85 mm
length of retouch margin	mean: 24.49 mm	range: 2.55 - 48.0 mm
length of retouch scars	mean: 2.91 mm	range: 0.95 - 7.9 mm

Provenience: level IV (1); level Ib (2)

Rough Bifaces

Only one specimen was assigned to this group (Plate 4i). It exhibited large flake scars across both surfaces. However, as there was only minimal edge retouch, and as the piece had not been completely shaped, it was differentiated from finished bifaces.

Material: Vitreous Quartzite

Measurements: length 46.7 mm

width 34.8 mm

thickness 11.35 mm

Provenience: level IV

Finished Bifaces

In addition to having extensive flake scars across both surfaces, members of this group had been shaped by the removal of retouch flakes along the lateral margins. The only specimen to be assigned to this category was bipointed in form (Plate 4k).

Material: Vitreous Quartzite

Measurements: length 70.0 mm

width 34.8 mm

thickness 11.34 mm

Provenience: level IV

Projectile Points

Projectile points were differentiated as a special class of finished bifaces on the basis of edge retouch and the shaping of the basal end. Although the stylistic variation within this assemblage was rather significant, certain techniques of manufacture were found to be continuous. Flake scars were all broad and shallow. Grinding, while it was less noticeable on specimens from the upper strata, was present on the basal portions of all points. The diagnostic importance of these artifacts has necessitated their detailed description at this point.

Stemmed Points: This type consisted of one reassembled specimen (Plate 4g) and one basal fragment (Plate 4h). The lateral edges of the stems had been extensively ground on both pieces. In addition, the complete point exhibited basal thinning by virtue of longitudinally directed flake scars.

Material: Chert

Measurements: (complete specimen only)

length 57.96 mm

width 26.85 mm

thickness 8.65 mm

stem length 22.70 mm

stem width 21.60 mm

Provenience: zone IIa-VII

Cultural affiliation: Early Taltheilei

Side-notched Points: One almost complete specimen was included in this type (Plate 5d). Flaking on this piece was crude, and the base was not thinned. Grinding was present only in the inside of the broad, shallow notches.

Material: Vitreous Quartzite

Measurements:	length	37.5 mm
	width	23.45 mm
	thickness	8.85 mm
	width at notch	18.2 mm
	base width	21.95 mm

Provenience: zone Ib-IV

Cultural affiliation: Late Taltheilei (?) Shield Archaic variant.

Plains-related Points: The one piece assigned to this type was a portion of a base (Plate 6i). Any assignment of cultural affiliation would, therefore, be only tenuous. The flaking pattern consisted of large, shallow flake scars which were directed transversely across the surface. Basal thinning was extensive. Grinding was noticed along the right lateral margin only.

Material: Vitreous Quartzite

Measurements:	length	13.0 mm
	width	18.2 mm (at base)
		15.5 mm (at notch)
	thickness	4.3 mm

Provenience: level IIa

Cultural affiliation: Hanna (?)

Miscellaneous: One small fragment appeared to be the base of a projectile point. However, so little remained that no statement could be made regarding its cultural affiliation (Plate 6j). It was found in the same stratigraphic component as the Hanna-like point.

Crushed and Pecked Tools

This group comprised a single hammerstone (Plate 6k) which exhibited areas of battering on several surfaces.

Material: Quartzite

Measurement: length 75.9 mm

width 40.8 mm

thickness 32.6 mm

Provenience: level IIa

DISCUSSION

Three distinct cultural components were identified in the Wentzel Lake assemblage. The term component refers to "... the manifestation of a given archaeological 'focus' at a specific site." (Willey and Phillips 1958: 21). Components, therefore, are site-specific occurrences of a taxonomic unit (a focus or phase). As used here, they are considered to be the culturally meaningful unit within the site as the artifacts within each component represent the occupation of the site by different groups.

Vertical Distributions

The analysis of the vertical distribution of artifacts, as illustrated in Table 7, indicates that three major periods of occupation occurred at the site. These occupations are represented by levels IV, IIa-VIII (hereafter referred to as component IV, IIa-VIII respectively). As component VII and Zone IIa-VIII were sterile of any cultural material throughout most of the site, it is assumed that the few artifacts which did occur in those strata are intrusive from upper levels. Such displacement has been widely noted, especially in sites with loose, sandy matrices (Mathews 1965; Stockton 1975; Hughes and Lampert 1977). Cultural strata occurring between the three major components are designated as zones, again with the assumption that the artifacts are intrusive. It is problematical as to whether these artifacts were displaced downward through occupational disturbances or had been forced upward by frost-induced expansion of the water particles contained within the soil matrix. Recent studies examining the nature and extent of this type of stratigraphic disturbance have proven inconclusive as regards buried lithic material (Johnson and Hansen 1974; Johnson _et al_. 1977). Stylistic homogeniety further mitigated against a distinct identification of the affiliation of these materials. However, for the most part, these zones contained very little diagnostic meterial.

Component IV

The earliest occupation of the Wentzel Lake site is represented by artifacts from stratigraphic level IV as well as the material which is

Material Type / Zone Level	1–A		1–B		1–C		1–E		6–B		6–C		6–D		7–A		7–B		7–C		7–E		7–H	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Ib	2	11.11	2	11.11	3	16.67					9	50	1	5.55					1	5.55				
Ib–IIa	1	3.33			1	3.33					1	3.33												
IIa	3	15	1	5	3	15	1	5			9	45					1	5	2	10				
Ia–IIb																			1	100				
IIb																					1	100		
IIa–III											1	100												
Ib–IV							1	14.29	1	14.29	2	28.57	1	14.29			1	14.29	1	14.29				
IIa–IV	1	100																						
IV	3	9.68			1	3.23	2	6.45	1	3.23	7	22.6	3	9.68	1	3.23	3	9.68	7	22.6	1	3.23	2	6.45
IIa–VII											1	100												
VII	1	33.3			1	33.3					1	33.3												

TABLE 7. MATERIAL TYPES OF FINISHED TOOLS

intrusive into level VIII and zone IIa-IV. Unifacially retouched flakes from this period (Plate 4 a-c) correspond to the tabular end scrapers assigned to the Early phase of the Taltheilei tradition (Gordon 1976a: Plate 4). In addition, a brown chert flake is bifacially retouched on its distal end (Plate 4f). A complete biface (Plate 4k) is bipointed in form with broad, shallow flake scars running transversely across both surfaces.

The most diagnostic artifacts from this component, however, are two projectile point fragments. Although one fragment had been shattered by exposure to intense heat, it was possible to reassemble virtually the entire specimen. The second fragment, however, was the incomplete basal portion of a stemmed point. While both specimens appeared to be stemmed varieties similar to those of the Hennessey complex (Noble 1971) or Early Period (Gordon 1976a, b) of the Taltheilei tradition, only the reassembled specimen is suitable for comparative analysis.

Archaeological investigations at Grant Lake and along the lower Dubawnt River, N.W.T. have revealed an archaeological sequence which extends to 8,000 years B.P. (Gordon 1976b: iv). Of particular relevance to component IV of the Wentzel Lake site, however, is the material which Gordon assigns to the Early phase (ca. 500 B.C. to A.D. 150) of the Taltheilei tradition. Projectile points from this phase all represent stemmed lanceolate forms. Features of these points include: gradual shoulders (relative to the abrupt shoulders of points from the Earliest phase); tapered bases which generally exhibit lateral grinding and may exhibit basal grinding; and plano-convex cross-sections. While the points from this period are somewhat formally variable, they are generally similar to the early forms from the Wentzel Lake site. One specimen in particular (Gordon 1976b: Plate 16e) is especially reminiscent of the Alberta piece. Gordon describes this sole example of a complete projectile point from level 2b of the Migod site as:

> ... asymmetric in plan and elliptical cross-section [with] medium and crude oblique primary and retouch flake scars with light crushing and hinge fracturing. Lack of grinding and the relatively crude flaking suggests it may be a preform. (Gordon 1976b: 105)

Measurements of this specimen are: length 47.3 mm; width 17.6 mm; thickness 6.5 mm; and weight 5.3 g. The base is 17.0 mm long and 9.0 mm wide (ibid: Table 29). Another complete Early Taltheilei projectile point is more dissimilar to the Wentzel Lake specimen. This is a "... complete tapered stem point ..." with "... a plano-convex cross-section, fine oblique and transverse primary flaking, crude lateral flaking, and extensive grinding along its basal and lateral edges." (ibid: 113; Plate 20a). This piece is 74.7 mm long, 23.6 mm wide, 8.2 mm thick and weighs 13.6 g. The base is 19.6 mm long and 26.5 mm wide.

The reassembled specimen from the Wentzel Lake site, while not identical to either of these specimens, is stylistically comparable. Metrically, it lies between the two Grant Lake specimens, being larger than the one from Gordon's level 2b but smaller than his level 2 specimen. Interestingly, the stem of the point from Alberta is nearly as wide as it is long (21.60 mm wide by 22.70 mm long) as compared with the relatively long and narrow base of the level 2b specimen and the short, squat base of the level 2 piece. Nevertheless, all three conform to a generalized outline of Early Taltheilei points (Gordon 1976a: Fig. 4; 1977 personal communication).

This affinity is even more apparent in the manufacturing technique. Shouldering on all is gradual with a tapering basal portion. On complete forms lateral edges of the stems are ground. These two features separate the Early period from the preceding Earliest period of the Taltheilei tradition (Gordon 1976a, b). As culturally diagnostic traits, therefore, they are important in the elucidation of cultural affinities between sites with geographical proximity.

Stemmed projectile points which may be compared with the Wentzel Lake specimens are rare in other northern assemblages. Nash (1975: 157) describes two stemmed points from the Baralzon Lake vicinity (site NM-62-14) in northern Manitoba. These quartzite specimens have ovate blades and straight bases. There is no indication as to whether the stems exhibit grinding. Included in the assemblage with the stemmed points are a number of side- and corner-notched points. The inclusion of Early (i.e. stemmed) with Middle and Late (i.e. side-notched) Taltheilei forms makes comparisons with this assemblage difficult. It would seem, however, that the presence of later, side-notched varieties would place the Manitoba assemblage in a later time period than the Wentzel Lake material.

A projectile point from site IgNj-2 in northern Saskatchewan has been described as belonging to Noble's Hennessey complex (Minni 1976: 154). (This complex is stylistically equivelant with Gordon's Early period.) This complete quartzite specimen has a subconvex base which has been thinned and exhibits light grinding. Moderate grinding is present along both lateral margins. This piece measures 61.6 mm long, 32.6 mm wide, 9.3 mm thick and has a basal width of 27.5 mm. These data are favourably comparable with those of the Wentzel Lake specimen. Unfortunately, a visual inspection of the two points (ibid: Plate 2:1; this report Plate 4g) reveals that the two are formally very distinct. It may be argued, nevertheless, that a cultural continuity exhibited in manufacturing techniques exists between the two areas. As no date was obtained from IgNj-2 the temporal aspect of this relationship remains undefined.

The Early period of the Taltheilei tradition is represented in the vicinity of Lake Athabasca at the Beaverlodge-Athabasca portage site (IiOd-2) (Wright 1975: 54 ff). There, the basal fragment of a stemmed point was recovered. This fragment, which possesses light lateral grinding and basal thinning, has a shoulder width of 25.0 mm, a basal width of 17.0 mm and a base thickness of 6.0 mm (ibid: 65; Plate V, Fig. 23). While any comparison between this and the Wentzel Lake specimen is nebulous, it is significant that the body and stem width of the two points (as measured at the shoulder) are similar. The co-occurrence of lateral grinding and basal thinning are further indications of the cultural relationship between the two specimens.

It is difficult to delineate definite cultural ties with as small a sample of diagnostic artifacts as was found at the Wentzel Lake site. Nevertheless, a survey of archaeological material from northern Alberta, Saskatchewan, Manitoba and the southern Keewatin District, N.W.T. indicates that some relationship exists throughout this area. Although the size and specific outline of the projectile points of the Early Taltheilei period vary it may be argued that such variations are well within the range of idiosyncratic behaviour and adaptability to changes of lithic types. Significantly, all points exhibit grinding along the lateral margins of the stems and bases are either ground or thinned. On these grounds (metric analysis and manufacturing technique) therefore, it seems reasonable to describe the artifacts from component IV of the Wentzel Lake site as being related to the Early phase of the Taltheilei tradition.

Component IIa

A second major concentration of artifacts occurs in stratigraphic level IIa. Although the basal fragments of two projectile points were recovered, both are too incomplete to allow any conclusive statement to be made regarding their cultural affiliations. One, in fact, cannot be even tentatively identified (Plate 6j). The other (Plate 6i) is a brown quartzite specimen which may be part of a Hanna-like point (G. Adams personal communication). Its concave base has been thinned by the removal of small, distally directed flakes from both surfaces. The few flake scars that are discernable on this piece are broad and shallow, and light grinding occurs along the interior of the right lateral notch. Other artifacts from this component include various thinned flakes (Plate 6b, h), blunted flakes (Plate 6a), bevelled flakes (Plate 6c, d, e, g) and a hammerstone (Plate 6k).

Intersite comparisons with this component are difficult. Several features indicate a Plains (rather than Boreal Forest) influence in the manufacture of the projectile point. These include a distinctively concave base and the formation of "eared" tangs between the base and the notches. These may be contrasted with the straight or convex bases and more definite side-notches which occur on points of later phases in the Boreal Forest.

Component Ib

No projectile points or point fragments occurred in component Ib. The retouched flakes (Plate 7, a-h) are most reminiscent of those from component IIa. It is noteworthy that both components IIa and Ib yielded scrapers made on a wide variety of flake sizes.

Horizontal Distributions

It has been noted in a previous chapter (chapter five) that the excavated units do not constitute a statistically significant sample of the site area. Therefore, any statement which is made regarding the activity areas is done in non-probabilistic terms. Certain variations occur in the numbers of artifacts which were recovered from different areas of the site. Although specific activity areas cannot be defined and delineated, it is possible to describe areal concentrations of artifacts.

A higher density of artifacts is evident in the eastern portion of the site. Flakes and finished artifacts were considered in a computation of "artifacts per square metre". As all units were excavated to similar depths (average: east 72.7 cm; west 75.0 cm), the use of square metres rather than cubic metres is not believed to introduce a measurable bias to the sample. The results indicate that an average of 94.1 pieces (maximum: 251; minimum: 6) were recovered from the eastern portion of the site (units A-K; Fig. 3 part 1) while an average of 21.17 pieces (maximum: 51; minimum: 11) per square metre were recovered from the remainder of the site area (units L-Q; Fig. 3 parts 2-5). Considering tools alone, 3.38 per square metre were recovered from the eastern end of the site and 1.2 per square metre derived from other areas. It is evident from these data that the eastern end of the site was more intensively utilized than the other areas.

The north-south, or lakeward/landward, occupational preference was also examined. Excavations at the eastern end of the site were especially suited for such an interpretation as they transected the terrace along a north-south axis. A comparison of the relative artifact concentration in these units provided a measure of areal utilization. The lakeward sample composed of units A, D, E and J, yielded 33.37 percent of the artifacts while 10.52 percent was found in the most landward units (C, I and K). A middle area, represented by units B, F, G and H, contained the majority of artifacts (56.11 percent). If only the tools were considered the area of preferred occupation remained the middle zone (46.59 percent). The second highest concentration was found in the most landward units (25.0 percent) and the lowest percentage (13.64 percent) of artifacts was in the lakeward units. It may be inferred from these data that the central area was favoured overall, for all kinds of activities. The more lakeward area was the preferred region of flaking and tool making, while activities involving the use of these tools took place in the most landward area.

Two factors which would have figured most prominently in the selection of specific activity areas at this site would have been the slope of the beach terrace and the availability of shelter from northerly winds. In these terms, the middle area was the most desirable as it combined both flatness and protection. The lakeward portion, while more level, was considerably more exposed. Conversely, the landward area was the most sheltered part of the site but had the most pronounced slope. Thus, the horizontal distribution of artifacts may be related to the physiography of the site.

8. CONCLUSIONS

The archaeological investigation of the Wentzel Lake site was undertaken with the hope that at least some portion of the diastema in our knowledge of the prehistory of the area might be bridged. The primary problems addressed in this study are the identification of site utilization patterns and the elucidation of a regional cultural history. In addressing the question of site utilization it was anticipated that if different cultural groups exploited different resource bases, the various cultural patternings would be reflected in the distribution of artifactual remains. Furthermore, the various patternings themselves may aid in the delineation of cultural occupations and so assist in the description of the archaeological sequence.

The correlation of the site sequence with a regional archaeological chronology involved a non-statistical comparison of certain classes of artifacts which are considered to be culturally diagnostic. While these invariably include projectile points, scrapers and other tools were compared whenever the available data was sufficient. Although the Caribou Mountains lie within the Boreal Forest, they are within close proximity to both the Barrenlands and the Aspen Parklands. Therefore, it is to be expected that a considerable variety in cultural influences would occur. It might also be expected that the local sequence would not be easily correlated with sequences from either the Boreal Forest, the Barrenlands or the Parklands, but might demonstrate an admixture of all three.

THE DATA

Archaeological visibility constitutes a primary problem in the investigation of sites in the Boreal Forest. Such sites as do exist are, invariably, located along eskers or the shorelines of lakes and rivers. Here, however, erosional factors often deflate the stratigraphy and blend otherwise distinctive cultural traditions into unified artifact assemblages. In other instances, where erosion may be less active, a sandy matrix may artificially collapse the cultural strata. Often what appears to be gradual change and cultural continuity is a distortion of distinct cultures supplanting one another after a hiatus of varying lengths (Hughes and Lampert 1977). Thus, even when enough data can be recovered to construct a culture sequence the nature of the culture dynamics may remain elusive. Edaphic factors within the Boreal Forest also prohibit the recovery of any identifiable faunal remains. Without this aspect of the assemblage any statement regarding site use or seasonality of occupation can be done only with the greatest amount of caution.

These limiting factors make it necessary to infer many statements regarding site use. In order that these inferences be as sound as possible careful consideration must be made of all potential resources within the site area. Ethnographic analogy provides a useful comparison of general activity patterns. Although most native cultures in the Boreal Forest had changed drastically by the time ethnographers recorded them for posterity, those groups which still functioned according to "traditional" ways probably maintained a yearly round of activities which did not differ greatly from the prehistoric occupants of the same area. The use of such analogies may provide insights where the loss of faunal material has obscured the archaeological record.

Stratigraphic sections of the Wentzel Lake site revealed seven cultural levels superimposed on five culturally sterile levels. The configuration of the basal strata indicated that the lake level had formerly been a good deal higher than it is at present, and that the initial cultural occupation had occurred at that time. Three radiocarbon assays were obtained on samples of organic flotsam that had been deposited within the various strata. Although these dates do not provide specific date of cultural activity areas, they do indicate the maximum and minimum age limits of the various cultural components. A fourth radiocarbon date was obtained on a piece of burnt wood. This date, however, proved to be out of sequence with the date of the underlying strata. It seems likely that this sample has either been greatly contaminated or represents the use of old driftwood as fuel for fires.

The 84 culturally diagnostic artifacts are separated into three cultural components. This rather small assemblage includes five projectile points and point fragments; only three of which are complete enough to permit comparisons with other assemblages. The similarity of the other artifacts and the possibility of cultural mixing is also problematical in the delineation of cultural complexes. These qualifications should be kept in mind throughout the discussion of the regional prehistoric framework. The sequence proposed here is but a hypothetical ordering of the data in light of the material recovered from the Wentzel Lake site.

SITE USE

Direct evidence concerning the reason for the occupation of the Wentzel Lake site is lacking. Faunal remains and, probably, much of the material cultural goods have been destroyed by the podzolic soils. Nevertheless, given certain limitations imposed by the geography, as well as the faunal distributions, a pattern of site utilization may be extrapolated.

Although Wentzel Lake is accessible throughout the year, it is unlikely that the prehistoric population utilized the area on a year-round basis. In the months when the waterways are not frozen, the lake may be reached via Wentzel River which flows south to the Peace River. Alternatively, winter utilization of the lake area would have necessitated traversing part of the uplands region on foot. While this would not have presented any great obstacle to a prehistoric population, it is unlikely they would have undertaken such an excursion without a reasonable promise of a return for their effort.

As was noted in the discussion of the regional fauna, the Caribou Mountains comprise a modified Hudsonian faunal zone. Major large mammals of this zone include black bear, moose, woodland caribou, Barrenground caribou and wood bison. It is unlikely, however, that either Barrenground caribou or wood bison ever ranged in the vicinity of Wentzel Lake. The locality is substantially far removed from the calving grounds of the Beverly caribou herd so that a very severe climatic deterioration would be necessary before the herd moved as far south as Wentzel Lake. On the other hand, wood bison are a grazing species that is largely confined to "... aspen parklands, meadows, river valleys, and even coniferous forests." (Banfield 1974: 406). These grazing animals live primarily on "... grasses, forbs, and sedges. Among these staple food items are wheat ~~grass, b~~rome grass, wild rye, wild oats, June grass, blue grass, vanilla grass, salt grass, foxtail grass and spear grass." (ibid: 406). In light of the moss ground cover and poorly drained soils, it is unlikely that these animals ranged into the Caribou Mountains in any large numbers.

Other large mammals which occur in the area, such as the black bear, moose and woodland caribou, are all non-gregarious species. The latter two, however, aggregate during the breeding season: early October to early November for woodland Caribou; and mid-September to late November for moose (ibid: 386; 396). Black bear, however, are more solitary animals, pairing up only briefly during the mating season between mid-June and mid-July. In terms of the utilization of large mammal resources, therefore, the Caribou Mountains would be most viable during the late fall and early winter months.

This period of utilization coincides with the southward migration of numerous species of avifauna. As has been noted, the flyways of numerous species pass over the Caribou Mountains. It is to be expected, therefore, that at least some would use the area as overnight resting areas.

The absence of one, single important resource within the Wentzel Lake area suggests that the prehistoric population adopted a generalized exploitation pattern with regards to the area. That is, when the region was visited the timing was such as to facilitate the harvesting of as many different resources as possible. As the lake is but sparsely populated with fish (Smith 1970) it is probable that large mammals constituted the primary resource. Of the potential game animals, moose, woodland caribou and bear comprise the largest species. While all three are generally solitary species, the annual rutting season of the caribou and moose brings these animals together in small groups, thus increasing the potential harvest for the hunter. The coincidence of the fall migration of various birds at this time significantly increases the number and variety of animals in the area. It seems most plausible, therefore, that prehistoric people would focus their utilization of the area during this time of the year.

The archaeological record, as far as it is applicable, seems to confirm this postulation. Ethnographic accounts reveal that the hunting of large solitary animals was done by small family associations in which two or three males stalked the game. The presence of a small number of artifacts clustered within a small (relative to the site area) locality may be indicative of an occupation by just such a group of hunters and gatherers.

REGIONAL PREHISTORIC FRAMEWORK

The comparison of the archaeological sequence from the Wentzel Lake site with other sequences is impeded by the paucity of artifacts from the northern Alberta site. It is true that the affinities which are noted may be merely enigmatic occurrences of styles which bear certain generalized similarities to other assemblages. The lack of a larger assemblage of artifacts that includes both "normal" forms as well as idiosyncratic variations places great restraints on the discussion of stylistic variability within the site. Nevertheless, certain manufacturing techniques exhibited within the Wentzel Lake material are manifest in other assemblages. By including these as culturally significant stylistic traits it may be possible to strengthen otherwise generalized assemblage associations.

Component IV

The material remains of the earliest cultural occupation of the Wentzel Lake site, which occurred sometime between 2615 ± 85 B.C. and 1635 ± 60 B.C., bears some resemblances to the Early Taltheilei period. In particular, the asymmetrically stemmed projectile point is especially reminiscent of forms found at the Migod site (Gordon 1976b in the Keewatin District, N.W.T. The stemmed Taltheilei points within that assemblage range from 47.3 mm to 74.7 mm in length and 17.6 mm to 23.6 mm in width. The stems of these points vary from 17.0 mm to 19.6 mm long by 9.0 mm to 26.5 mm wide. Significantly, the lateral edges of the stems are all ground and the convex bases are either ground or thinned. Metrically, the Wentzel Lake specimen lies well within the ranges recorded in the more northerly assemblage. Furthermore, the specimen has been ground laterally along the stem and the base has been thinned. In general, it conforms well to the pattern of Early Taltheilei points (Gordon personal communication).

Early Taltheilei, the second of four periods within the Taltheilei tradition, is dated from 500 B.C. to A.D. 150 (Gordon 1976a). It is preceded by the Earliest Taltheilei period in which the diagnostic artifacts consist of stemmed and lanceolate projectile points which lack basal or lateral grinding. The oldest dated Taltheilei material within the Northwest Territories has come from sites along the upper Thelon River, the lower Dubawnt River and Rennie Lake. The location of these sites within the range of the Beverly caribou herd has led Gordon (1976a: 7) to suggest that this culture originated to the south and west of the Slave River and Lake Athabasca. Although present evidence would tend to support this, the pattern of migration or diffusion it implies is problematical.

So far, no evidence of the Earliest Taltheilei period has been reported from the Peace-Athabasca-Slave drainage. This may well be a sampling error as the archaeology of the area is relatively unknown. However, until the prehistory of the area is more fully understood it must remain a moot point as to whether the evidence of the Taltheilei tradition at Wentzel Lake represents an influence from the north or the remains of a more southerly people who were migrating (or whose culture was diffusing) northward.

The consideration of this problem illustrates a major difficulty which is encountered whenever prehistoric lifeways are inferred from ethnographic data. Gordon (1976c: 8) has stated that:

> The Taltheilei tradition is ... the general way of life of the barrenland Déné (Athapascan) peoples as reflected in their artifacts from their earliest prehistoric occupation to the historic period.

The concerted effort on harvesting migratory caribou this implies necessitated a lifestyle which was closely tied to the herd; a life-style which would be slow to develop. Indeed, it is likely that only after long exposure to the herds would a population leave the relative affluence of the forest for the Barrenlands. At the present time, the caribou herds winter in the forest edge along the middle Mackenzie River drainage and, only occasionally, in northern Saskatchewan. It does not appear as though the climatic fluctuation was ever severe enough for the herds to migrate south and west of Lake Athabasca.

It appears, therefore, that what the archaeological evidence suggests other evidence contradicts. Archaeologically, Early Taltheilei-like material from the Caribou Mountains predates similar material in the Barrenlands by ca. 3,000 years. Yet, if Taltheilei is to be identified as the cultural remains of a Barrenland caribou hunting people, one would expect the origins to derive from an area where there was at least a seasonal exposure to the animals. Until further evidence clarifies the archaeological sequence in northern Alberta, this rather contradictory situation must remain unexplained.

Component IIa

Following the initial occupation of the Wentzel Lake site, a Plains influence is manifested. This is apparent from the artifacts in component IIa, the most diagnostic of which is the basal portion of a Hanna-like projectile point. Dated at ca. 1,540 ± 100 B.P., this component is approximately contemporaneous with cultures containing Hanna points on the Plains. It would seem, therefore, that this component represents a southern influence within the Boreal Forest. Although it is not possible to determine if this influence occurred through a diffusion of ideas or followed from the northward migration of a southern group, the presence of elements of a Plains culture in this area of the Boreal Forest is not overly surprising.

The woodland subspecies of the bison range is within the Aspen Parkland and open areas of the coniferous forest. It is within the ecotonal areas that a wide variety of fauna and flora occur, creating an "edge effect" (Odum 1971: 157). If the Hanna-like projectile point is understood as representing the influence of a southern, bison hunting culture, then its presence at the Wentzel Lake site may be indicative of the northern adaptation of such a culture. Moose, woodland caribou and black bear comprise the primary large faunal resources of the area. It may be, therefore, that the artifacts in component IIa represent an excursion of a group which relied more heavily upon bison as a food resource.

The archaeological sequence from the Caribou Mountains is far from complete. Data recovered from the Wentzel Lake site are ambiguous in light of the materials recovered from contiguous areas. The isolation and scarcity of food resources may have made the Wentzel Lake vicinity a relatively unused area. In such a case, it is not unlikely that the sequence of prehistoric cultures is a distortion of the regional prehistory. Visited sporadically by small groups of hunters, many features of the cultural sequence may have by-passed the area. Nevertheless, the archaeological chronology of the Wentzel Lake site raises important questions regarding the cultural dynamics which were operative in northern Alberta <u>ca.</u> 5,000 years ago.

REFERENCES

Adney, E. J. and H. I. Chapelle
1964 The bark canoes and skin boats of North America. Smithsonian Institute, Washington.

Allan, John A.
1943 Geology. Report No. 34. Research Council of Alberta, Edmonton.

Atlas of Alberta
1969 University of Alberta Press, Edmonton.

Back, Captain George
1970 Narrative of the Arctic Land expedition. Hurtig, Edmonton.

Banfield, A.W.F.
1974 The mammals of Canada. University of Toronto Press, Toronto.

Bartley, David D. and Barry Matthews
1969 A paleobotanical investigation of postglacial deposits in the Sugluk area of northern Ungava (Quebec, Canada). Review of Paleobotany and Palynology 9: 45-61.

Bayrock, L. A.
1960 Surficial geology. In Preliminary soil survey report 60-1 by J. D. Lindsay, S. Pawluk, and W. Odynsky. Research Council of Alberta, Edmonton.

Binford, Lewis R.
1964 A consideration of archaeological research design. American Antiquity 29: 425-441

1968 Archaeological perspectives. In New perspectives in archaeology edited by Sally R. and Lewis R. Bindford. Aldine, Chicago.

Bostock, H. S.
1970 Physiographic subdivisions of Canada. In Geology and economic minerals of Canada, Economic Geology Report No. 1. Department of Energy, Mines and Resources, Ottawa.

Brown, James A.
1975 Deep-site excavation strategy as a sampling problem. In Sampling in archaeology, edited by James W. Meuller. University of Arizona Press, Tucson.

Bryan, Alan L.
1969 Late protohistoric Cree expansion into north central Alberta. Western Canadian Journal of Anthropology 1: 32-38.

1975 Dunvegan damsite archaeological and historical site study. Typescript submitted to Alberta Department of the Environment, Edmonton.

Bryan, Alan L. and Gerald Conaty
1975 A prehistoric campsite in northwestern Alberta. Western Canadian Journal of Anthropology 5: 64-91.

Bryson, Reid, William N. Irving, and James A. Larsen
1965 Radiocarbon and soil evidence of former forests in the southern Canadian tundra. Science 147: 46-48.

Chenall, Robert
1975 A rational for archaeological sampling. In Sampling in archaeology, edited by James W. Meuller. University of Arizona Press, Tucson.

Clark, Donald W.
1975 Archaeological reconnaissance in northern interior District of Mackenzie: 1969, 1970, and 1972. National Museum of Man Mercury Series No. 27. Archaeological Survey of Canada, Ottawa.

Conaty, Gerald
1974 The Karpinsky site: a prehistoric assemblage from the Peace River district. Unpublished B. A. (Honours) thesis. Department of Anthropology. University of Alberta.

Dictionary of Geology
1972 Penguin Books, Markham.

Donahue, Paul F.
1976 Archaeological research in northern Alberta: 1975. Archaeological Survey of Alberta Occasional Paper No. 2. Alberta Culture, Historical Resources Division, Edmonton.

Fedirchuk, Gloria S.
1974 Peace-Athabasca-Slave archaeological project, the Penner site: salvage excavation. Archaeological Survey of Alberta, Edmonton. Manuscript.

Fladmark, Knut R.
1975 Peace past - report on an archaeological reconnaissance of the Peace River basin, British Columbia, 1974. Archaeological Survey of Alberta, Edmonton. Xeroxed.

Gordon, Bryan C.
1975 Of men and herds in barrenland prehistory. National Museum of Man Mercury Series No. 28. Archaeological Survey of Canada, Ottawa.

1976a Chipewyan prehistory. Paper presented at the 1976 conference on prehistory of the North American subarctic: the Athapaskan question, Calgary.

1976b Migod - 8,000 years of Barrenland prehistory. National Museum of Man Mercury Series No. 56. Archaeological Survey of Canada, Ottawa.

1976c Temporal, archaeological and pedological separation of the barrenland Arctic Small Tool and Taltheilei traditions. Paper presented at the 1976 conference on prehistory of the North American subarctic: the Athapaskan question, Calgary.

Hansen, H. P.
1950 Postglacial forests along the Alaska highway in British Columbia. Proceedings of the American Philosophical Society 94: 411-421.

Hearne, Samuel
1958 A journey to the northern ocean, edited by Richard Glover. MacMillan, Toronto.

Hughes, P. J. and R. J. Lampert
1977 Occupational disturbance and types of archaeological deposit. Journal of Archaeological Science 4(2): 135-140.

Irving, William N.
1968 Prehistory - the Barren Grounds. In Science, history, and Hudson Bay, edited by C. S. Beals. Department of Energy, Mines and Resources, Ottawa.

Jenness, Diamond
1937a The Indian background of Canadian history. Bulletin No. 86. National Museum of Canada Anthropological Series No. 21. Ottawa.

1937b The Sekani Indians of British Columbia. National Museum of Canada Bulletin No. 84. Ottawa.

Johnson, Donald L. and Kenneth L. Hansen
1974 The effects of frost-heaving on objects in soil. Plains Anthropologist 19-64: 81-89.

Johnson, Donald L., D. R. Muhs and M. L. Barnhardt
1977 The effects of frost heaving on objects in soils, II: laboratory experiments. Plains Anthropologist 22-76: 133-147.

Larsen, James A.
1965 The vegetation of Ennaidai Lake area, Northwest Territories: studies in subarctic and arctic bioclimatology. Ecological Monographs 35: 37-39.

Lindsay, J. D., S. Pawluk, and W. Odynsky
1960 Exploratory soil survey of Alberta map sheets 84-6, 84-K, and 84-L. Preliminary soil survey report 60-1. Research Council of Alberta, Edmonton.

Losey, Timothy C.
1975 Archaeological investigations in Athabasca tar sands lease No. 13: a sample survey. Report on file at Archaeological Survey of Alberta, Edmonton.

Losey, Timothy C., R. Freeman, and J. Priegert
1975 Archaeological reconnaissance Alberta highways north: 1974. Report on file at Archaeological Survey of Alberta, Edmonton.

Losey, Timothy C. and J. Priegert
1975 Archaeological reconnaissance of Alberta highways in the boreal forest and transitional parkland/foothills region, 1975. Report on file at the Archaeological Survey of Alberta, Edmonton.

Mackenzie, Sir Alexander
1931 Alexander Mackenzie's voyage to the Pacific Ocean in 1793, edited by M. M. Quaife. Lakeside Press, Chicago.

MacNeish, Richard S.
1951 An archaeological reconnaissance in the Northwest Territories. National Museum of Canada Bulletin No. 123. Department of Resources and Development, Ottawa.

1953 Archaeological reconnaissance in the Mackenzie River drainage. National Museum of Canada Bulletin No. 128. Department of Resources and Development, Ottawa.

1954 The Pointed Mountain site near Fort Liard, Northwest Territories, Canada. American Antiquity 19: 234-253.

1955 Two archaeological sites on Great Bear Lake, Northwest Territories, Canada. National Museum of Canada Bulletin No. 136. Department of Northern Affairs and Natural Resources, Ottawa.

Masson, L. R.
1960 Original journals, narratives, letters, etc., relating to the Northwest Company, Vol. II: 1889 - 1890. Antiquarian Press, New York.

Mathews, J. M.
1965 Stratigraphic disturbance: the human element. Antiquity 39: 295-298.

McGhee, Robert
1970 Excavations at Bloody Falls, N.W.T., Canada. Arctic Anthropology 6: 53-72.

McLean, John
1932 Notes of a twenty-five years' service in the Hudson's Bay Territory, edited by W. S. Wallace. The Champlain Society, Toronto.

Millar, J.
1968 The archaeology of Fisherman Lake, western District of Mackenzie, N.W.T. Unpublished Ph.D. dissertation. Department of Archaeology, University of Calgary.

Minni, Sheila J.
1975 The prehistoric occupations of Black Lake, northern Saskatchewan. Unpublished M.A. thesis. Department of Anthropology and Archaeology, University of Saskatchewan, Saskatoon.

Morice, Reverend A. G.
1894 Notes archaeological, industrial, and sociological on the Western Dénés with an ethnographic sketch of the same. Transactions of the Canadian Institute 4.

1899 The Western Dénés. Proceedings of the Canadian Institute 25: 109-174.

Morlan, Richard E.
1973 A technological approach to lithic artifacts from Yukon Territory. National Museum of Man Mercury Series No. 7. Archaeological Survey of Canada, Ottawa.

Moss, E. H.
1955 The vegetation of Alberta. Botanical Review 21: 493-567.

Mott, R. J.
1973 Palynological studies in central Saskatchewan - pollen stratigraphy from lake sediment sequences. Geological Survey of Canada Papers 72-49.

Namais, J.
1970 Climatic anomaly over the United States during the 1960's. Science: 741-743.

Nash, Ronald J.
1975 Archaeological investigations in the Transitional Forest Zone: northern Manitoba, southern Keewatin, N.W.T. Manitoba Museum of Man and Nature, Winnipeg.

Nichols, Harvey
1967a Central Canadian palynology and its relevance to northwestern Europe in the late Quaternary period. Review of Paleobotany and Palynology 2: 231-243.

1967b Pollen diagrams from subarctic central Canada. Science: 155: 1665-1668.

Noble, William C.
1971 Archaeological surveys and sequences in the central District of Mackenzie, N.W.T. Arctic Anthropology 8: 102-135.

Odum, Eugene P.
1971 Fundamentals of ecology, third edition. W. B. Saunders Company, Toronto.

Osgood, Cornelius
1936 The distribution of the Northern Athapaskan Indians. Yale University Publications in Anthropology No. 7. Yale University Press, New Haven.

Plog, Fred T.
1973 Diachronic anthropology. In Research and theory in current archeology, edited by Charles L. Redman. John Wiley and Sons, New York.

Prest, V. K.
1970 Quaternary geology. In Geology and economic minerals of Canada, Economic Geology Report No. 1. Department of Energy, Mines and Resources, Ottawa.

Reeves, B.O.K.
1969 The southern plains paleocultural and paleo-environmental sequence. In Post-Pleistocene man and his environment, edited by R. G. Forbis, L. B. Davis, A. O. Christensen, and G. Fedirchuk. The Students' Press, University of Calgary, Calgary.

Rowe, J. S.
1972 Forest regions of Canada. Canadian Forestry Service, Ottawa.

Scheelar, M. D. and T. M. Macyk
1972 Soil survey of the Mount Watt and Fort Vermilion area. Soil survey report No. 30. Alberta Research Council, Edmonton.

Simpson, George
1938 Journal of occurrences in the Athabasca Department, 1820 and 1821, and report, edited by E. E. Rich. The Champlain Society, Toronto.

Sims, Cort
1975a The archaeological potential of tar sands lease 30. Report on file at the Archaeological Survey of Alberta, Edmonton.

1975b An archaeological survey of certain Boreal Forest highway projects in northeastern Alberta. Report on file at the Archaeological Survey of Alberta, Edmonton.

1975c An archaeological survey of the Namur Lake area in northeastern Alberta. Report on file at the Archaeological Survey of Alberta, Edmonton.

1976a The Boreal highways archaeological survey, 1976. Report on file at the Archaeological Survey of Alberta, Edmonton.

1976b Report of an archaeological survey of the Athabasca River. Report on file at the Archaeological Survey of Alberta, Edmonton.

Slobodin, Richard
1969 Criteria of identification of bands. In Contributions to Anthropology - band societies, edited by David Damas. Bulletin No. 228, Anthropological Series No. 84. National Museum of Canada, Ottawa.

Smith, A.
1970 Preliminary biological survey of lakes in the Caribou Mountains. Survey Report No. 11. Alberta Lands and Forests Wildlife Division, Edmonton.

Soper, J. D.
1941 History, range, and home life of the northern bison. Ecological Monographs 11: 348-412.

Steward, J. H.
1942 The direct historical approach to archaeology. American Antiquity 7: 337-344.

Stockton, Eugene D.
1973 Shaw's creek shelter: human displacement of artifacts and its significance. Mankind 9: 112-117.

Syncrude Canada Ltd.
1973 Syncrude Lease No. 17: an archaeological survey, compiled by T. C. Losey and Cort Sims. Syncrude Canada Ltd., Edmonton.

1974 The Beaver Creek site: a prehistoric stone quarry on Syncrude Lease No. 22, compiled by T. C. Losey and Cort Sims. Syncrude Canada Ltd., Edmonton.

Thomson, H. Ross
1973 An introduction to the prehistory of the Peace River country. Unpublished M.A. thesis. Department of Anthropology. University of Alberta, Edmonton.

Tuck, J. A. and R. McGhee
1976 Undating the Canadian Arctic. In Eastern arctic prehistory: Paleoeskimo problems, edited by Moreau S. Maxwell. Society for American Archaeology, Memoir 31.

Vanstone, James W.
1974 Athapaskan adaptations: hunters and fishermen of the subarctic forests. Aldine, Chicago.

Willey, Gordon R. and Philip Phillips
1958 Method and theory in American archaeology. Phoenix Books, The University of Chicago Press, Chicago.

Wright, J. V.
1972 The Aberdeen site, Keewatin District, N.W.T. National Museum of Man Mercury Series No. 2. Archaeological Survey of Canada, Ottawa.

1975 The prehistory of Lake Athabasca: an initial statement. National Museum of Man Mercury Series No. 29. Archaeological Survey of Canada, Ottawa.

Morice, Reverend A. G.
n.d. The great Déné race. Administration of Anthropos. Vienna.

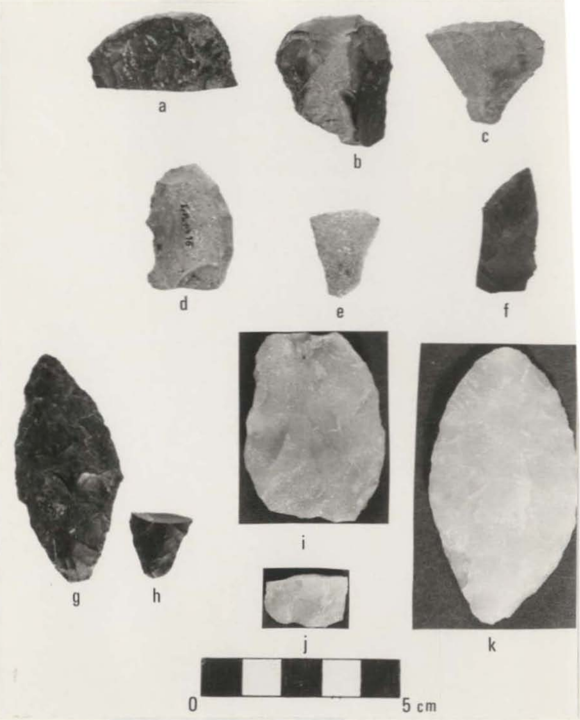


Plate 4. Finished tools from component IV (including component VIII and IIa - VIII).

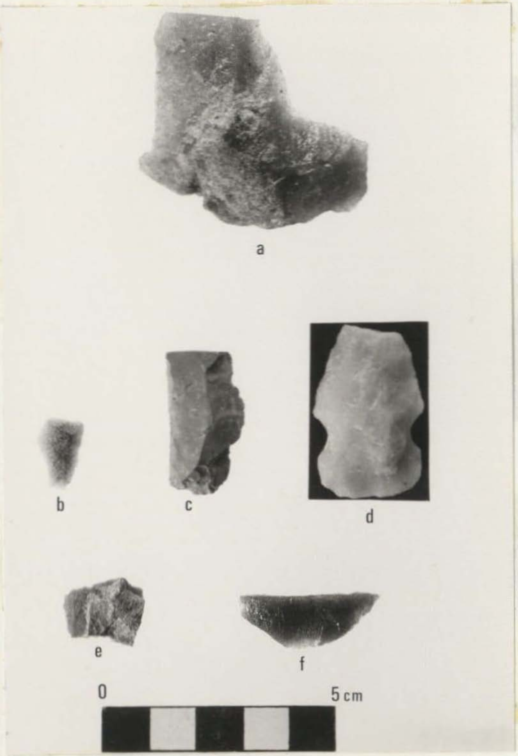


Plate 5. Finished tools from zones Ib - IV, IIa - III, and Ib - IIa.

Plate 6. Finished tools from component IIa.

Plate 7. Finished tools from component Ib.

APPENDIX I

DESCRIPTION OF TOOLS FROM WENTZEL LAKE SITE

In order that consistency might be maintained throughout the description of artifacts, each piece was oriented in a prescribed manner. The dorsal surface, identified by the presence of either cortex or multiple flake scars, faced upwards. The bulbar end of the flake was held towards the observer, and was defined as the proximal end. The left and right lateral margins were described from this bearing and retained their nomenclature when the artifact was turned over. The outline of each piece was described in geometric terms along with the adjective "expanding" or "contracting". These adjectives indicated whether the proximal or the distal end was wider. Hence, if the apex of a triangular piece was at the proximal end the outline of that artifact was described as "triangular/expanding".

Level VIII

This generally sterile component contained 3 artifacts, all of which were considered to be intrusive.

No. 213 Microscopically retouched flake

Unit: A Vitreous brown quartzite (6-C)

Provenience: 6 cm E 10 cm S 43 cm B.S.

L 22.0 mm W 16.1 mm Th. 3.2 mm

Outline: rectangular Cross-section: plano-convex

Margin of retouch: proximal right; left

Length of retouched margin: 1.03 mm (proximal right)
2.07 mm (left)

Retouch scars: continuous and adjacent

No. 219 Bevelled flake (Plate 4b)

Unit: B Black chert (1-A)

Provenience: 158 cm E 192 cm N 50 cm B.S.

L 34.6 mm W 28.9 mm Th. 10 mm

Outline: trapezoidal/expanding

Cross-section: concavo-convex

Margin of retouch: distal right

Length of retouched margin: 4.51 mm

Length of retouch scars: 0.4 mm

Angle of retouch scars: 66°

Retouch scars: continuous and overlapping

No. 236 Nicked and blunted flake (Plate 4c)

Unit: B Grey chert (1-C)

Provenience: 126 cm E 186 cm N 56 cm B.S.

L 26.1 mm W 29.8 mm Th. 3.7 mm

Outline: triangular/expanding

Cross-section: bi-convex

Margin of retouch: distal; right

Length of retouched margin: 3.04 mm (distal); 1.75 mm (right)

Length of retouch scars: less than 1 mm

Angle of retouch scars: 51° (distal); 76° (right)

Retouch scars: discontinuous and adjacent; continuous and overlapping

Zone IIa - VIII

Artifacts recovered from this zone represent the earliest cultural material recovered from the site.

No. 218 Core Fragment

Unit: B Vitreous brown quartzite (6-C)

Provenience: 198 cm N 180 cm E 41 cm B.S.

L 27.2 mm W 21.75 mm Th. 2.63 mm

Outline: trapezoidal/expanding

Cross-section: bi-planar

No. 233 Microscopically retouched flake

Unit: B Black chert (1-A)

Provenience: 40-50 cm B.S.

L 16.0 mm W 9.89 mm Th. 2.5 mm

Outline: rectangular

Cross-section: concavo-convex

Margin of retouch: distal/dorsal

Length of retouched margin: 5.65 mm

No. 214 Bevelled flake (Plate 4a)

Unit: B Black chert (1-A)

Provenience: 117 cm N 60 cm E 42 cm B.S.

L 20.4 mm W 34.8 mm Th. 4.7 mm

Outline: hemispherical

Cross-section: plano-convex

Margin of retouch: proximal

Length of retouched margin: 34.8 mm

Length of retouch scars: 4.15 mm

Angle of retouch scars: 55°

Retouch scars: continuous and overlapping

No. 220 Biface fragment (base of stemmed projectile point)

Unit: B (Plate 4h)

Black chert (1-A)

Provenience: 40-50 cm B.S.

L 16.55 mm W 15.95 mm Th. 4.6 mm

Outline: triangular/expanding

Cross-section: bi-convex

Flaking: lamellar; shallow

No. 215 Biface fragment (stemmed projectile point) (Plate 4g)
216
217 Black chert (1-A)

Provenience: 171 cm N 22 cm E 41 cm B.S.

L 57.95 mm W 26.85 mm Th. 8.65 mm

Stem: L 22.7 mm W 21.6 mm

Outline: ovate

Cross-section: bi-convex

Flaking: lamellar: shallow

Grinding on lateral margins and base of stem

Level IV

No. 308 Split pebble

Unit: E- Black chert (1-A)

Provenience: 50 cm N 43 cm E 57 cm B.S.

L 17.9 mm W 20.55 mm Th. 4.75 mm

Outline: trapezoidal/expanding

Cross-section: concayo-convex

No. 344 Split cobble

Unit: F White quartzite (7-C)

Provenience: 73 cm N 96 cm W 57 cm B.S.

L 53.65 mm W 40.95 mm Th. 25.95 mm

Outline: trapezoidal/contracting

Cross-section: plano-convex

No. 370 Split cobble

Unit: G Purple quartzite (7-H)

Provenience: 30-40 cm B.S.

L 22.25 mm W 15.95 mm Th. 33.25 mm

Outline: tabular

Cross-section: bi-planar

No. 371 Split pebble

Unit: G White quartzite (7-C)

Provenience: 30-40 cm B.S.

L 37.9 mm W 16.25 mm Th. 40.75 mm

Outline: trapezoidal/expanding

Cross-section: bi-planar

No. 372 Split pebble

Unit: G White quartzite (7-C)

Provenience: 30-40 cm B.S.

L 23.4 mm W 14.9 mm Th. 39.2 mm

Outline: trapezium/expanding

Cross-section: plano-convex

No. 373 Split pebble

Unit: G White quartzite (7-C)

Provenience: 30-40 cm B.S.

L 34.1 mm W 33.95 mm Th. 34.45 mm

Outline: parallelogram

Cross-section: plano-convex

No. 374 Split pebble

Unit: G Brown quartzite (7-B)

Provenience: 30-40 cm B.S.

L 29.0 mm W 12.65 mm Th. 21.3 mm

Outline: trapezoidal/expanding

Cross-section: bi-planar

No. 377 Split pebble

Unit: G. Vitreous white quartzite (6-D)

Provenience: 30-40 cm B.S.

L 39.25 mm W 26.2 mm Th. 14.7 mm

Outline: rectangular

Cross-section: plano-convex

No. 424 Split pebble

Unit: G Pink quartzite (7-E)

Provenience: 20-30 cm B.S.

L 57.95 mm W 41.0 mm Th. 20.3 mm

Outline: trapezoidal/expanding

Cross-section: bi-convex

No. 566 Split pebble

Unit: M Black chert (1-A)

Provenience: 20-30 cm B.S.

L 38.5 mm W 22.6 mm Th. 8.45 mm

Outline: ovate

Cross-section: plano-convex

No. 324 Core fragment

Unit: F Vitreous brown quartzite (6-C)

Provenience: 40-50 cm B.S.

L 38.0 mm W 10.9 mm Th. 20.4 mm

Outline: triangular/contracting

Cross-section: concavo-convex

No. 343 Core fragment

Unit: F Purple quartzite (7-H)

Provenience: 91 cm N 13 cm W 51.3 cm B.S.

L 34.0 mm W 24.2 mm Th. 27.1 mm

Outline: trapezoidal/expanding

Cross-section: wedge-shaped

No. 491 Core fragment

Unit: J Vitreous brown quartzite (6-C)

Provenience: 60-70 cm B.S.

L 24.0 mm W 29.6 mm Th. 10.2 mm

Outline: trapezoidal/expanding

Cross-section: bi-convex

No. 501 Core fragment

Unit: J Grey chert (1-C)

Provenience: 70-80 cm B.S.

L 62.55 mm W 32.55 mm Th. 12.9 mm

Outline: rectangular

Cross-section: concavo-convex

No. 564 Core fragment

Unit: M Vitreous brown quartzite (6-C)

Provenience: 20-30 cm B.S.

L 19.0 mm W 14.75 mm Th. 19.6 mm

Outline: rectangular

Cross-section: plano-convex

No. 79 Microscopically retouched flake

Unit: A Vitreous brown quartzite (6-C)

Provenience: 115 cm S 161 cm E 46.4 cm B.S.

L 13.75 mm W 16.1 mm Th. 3.8 mm

Outline: triangular/contracting

Cross-section: plano-convex

Margin or retouch: left

Length of retouched margin: 14.7 mm

No. 342 Microscopically retouched flake

Unit: F Vitreous brown quartzite (6-C)

Provenience: 50-60 cm B.S.

L 10.0 mm W 12.55 mm Th. 1.65 mm

Outline: trapezoidal/contracting

Cross-section: concavo-convex

Margin of retouch: distal

Length of retouched margin: 9.6 mm

No. 73 Thinned flake

Unit: A Brown quartzite (7-B)

Provenience: 186 cm S 52 cm E 44.5 cm B.S.

L 28.5 mm W 44.0 mm Th. 4.6 mm

Outline: ovate

Cross-section: bi-concave

Margin of retouch: left/proximal

Length of retouched margin: 11.6 mm

Angle of retouch scars: 25°

Length of retouch scars: 1 mm

Retouch scars: continuous and adjacent

No. 425 Thinned flake (Plate 4e)

Unit: I White quartzite (7-C)

Provenience: 20-30 cm B.S.

L 22.3 mm W 73.0 mm Th. 39.5 mm

Outline: triangular/expanding

Cross-section: bi-planar

Margin of retouch: distal

Length of retouched margin: 10.5 mm

Angle of retouch scars: 35°

Length of retouch scars: 1.5 mm

Retouch scars: continuous and adjacent

No. 476 Blunted flake (Plate 4d)

Unit: J Black chert (1-A)

Provenience: 60-70 cm B.S.

L 31.95 mm W 22.3 mm Th. 10.95 mm

Outline: trapezium/expanding

Cross-section: concavo-convex

Margin of retouch: left

Length of retouched margin: 2.97 mm

Angle of retouch scars: 55°

Length of retouch scars: 3.7 mm

Retouch scars: continuous and adjacent

No. 91 Uniface fragment (Plate 4J)

Unit: A White quartzite (7-C)

Provenience: 188 cm S 132 cm E 46.3 cm B.S.

L 13.0 mm W 20.65 mm Th. 7.0 mm

Outline: rectangular

Cross-section: bi-convex

Flaking: lamellar; shallow

No. 72 Rough biface (Plate 4i)
Unit: A White quartzite (7-C)
Provenience: 198 cm S 48 cm E 45.6 cm B.S.
L 46.7 mm W 34.8 mm Th. 11.35 mm
Outline: rectangular
Cross-section: bi-convex
Flaking: lamellar; shallow

No. 585 Biface (Plate 4k)
Unit: H Vitreous quartzite (6-D)
Provenience: 65 cm N 57 cm E 28 cm B.S.
L 70 mm W 37.5 mm Th. 8.0 mm
Outline: ovate, bi-pointed
Cross-section: concavo-convex
Flaking: lamellar; shallow

No. 475 Bifacially retouched flake (Plate 4f)
Unit: J Brown chert (1-E)
Provenience: 60-70 cm B.S.
L 31.85 mm W 14.8 mm Th. 2.7 mm
Outline: trapezium
Cross-section: concavo-convex
Margin of retouch: proximal left/proximal right
Length of retouched margins: 39.5 mm
Length of retouch scars: 2.3 mm
Retouch scars: continuous/overlapping

Zone IIa-IV

No. 623 Microscopically retouched flake

Unit: A Black chert (1-A)

Provenience: 40-42 cm B.S.

L 10.6 mm W 10.9 mm Th. 5.6 mm

Zone Ib-IV

No. 421 Split cobble

Unit: I White quartzite (7-C)

Provenience: 10-20 cm B.S.

L 40.6 mm W 31.0 mm Th. 13.8 mm

Outline: rectangular

Cross-section: bi-convex

No. 240 Microscopically retouched flake

Unit: C Vitreous brown quartzite (7-C)

Provenience: 10-20 cm B.S.

L 23.8 mm W 33.75 mm Th. 5.35 mm

Outline: trapezoidal/contracting

Cross-section: concavo-convex

Margin of retouch: proximal

Length of retouched margin: 17.3 mm

No. 245 Microscopically retouched flake

Unit: C Vitreous brown quartzite (7-C)

Provenience: 10-20 cm B.S.

L 18.8 mm W 14.7 mm Th. 3.15 mm

Outline: ovate

Cross-section: concavo-convex

Margin of retouch: proximal

Length of retouched margin: 9.6 mm

No. 248 Nicked flake (Plate 5b)

Unit: C Brown quartzite (7-B)

Provenience: 10-20 cm B.S.

L 15.9 mm W 9.8 mm Th. 2.9 mm

Outline: triangular/contracting

Cross-section: plano-convex

Margin of retouch: proximal

Length of retouched margin: 17.9 mm

Angle of retouch scars: 65°

Length of retouch scars: less than 1 mm

Retouch scars: continuous and adjacent

No. 553 Blunted flake (Plate 5c)

Unit: K Brown chert (1-E)

Provenience: 197 cm N 11 cm E 45.5 cm B.S.

L 31.4 mm W 16.5 mm Th. 4.0 mm

Outline: rectangular/expanding

Cross-section: concavo-convex

Margin of retouch: left

Length of retouched margin: 29.35 mm

Angle of retouch scars: 69°

Length of retouch scars: 2.3 mm

Retouch scars: continuous and adjacent

No. 552 Biface fragment (side-notched projectile point) (Plate 5d)

Unit: K Vitreous white quartzite (6-D)

Provenience: 186 cm N 185 cm E 48.8 cm B.S.

L 37.5 mm W 23.45 mm Th. 8.85 mm

Notch: W 18.2 mm

Base: W 21.95 mm

Grinding on inside of notches

Flaking: lamellar and shallow

Zone IIa-III

No. 63 Bevelled flake (Plate 5a)

Unit: A Vitreous brown quartzite (6-C)

Provenience: 68 cm S 128 cm E 37.2 cm B.S.

L 45.35 mm W 47.95 mm Th. 16.15 mm

Outline: rectangular

Cross-section: bi-convex

Margin of retouch: left

Length of retouched margin: 27.45 mm

Angle of retouch scars: 76°

Length of retouch scars: 2.9 mm

Retouch scars: continuous and overlapping

Level IIb

No. 302 Core fragment

Unit: A Pink quartzite (7-E)

Provenience: 83 cm N 94.5 cm E 31 cm B.S.

L 18.65 mm W 13.9 mm Th. 16.0 mm

Outline: trapezoidal/expanding

Cross-section: tabular

Zone Ia-IIb

No. 346 Split cobble

Unit: G White quartzite (7-C)

Provenience: 2 cm N 92 cm W 10-20 cm B.S.

L 50.5 mm W 54.55 mm Th. 20.0 mm

Outline: trapezoidal/contracting

Cross-section: plano-convex

Level IIa

No. 148 Core fragment

Unit: B Vitreous brown quartzite (6-C)

Provenience: 20-30 cm B.S.

L 20.6 mm W 11.0 mm Th. 8.0 mm

Outline: rectangular

Cross-section: bi-planar

No. 181 Microscopically retouched flake

Unit: B Vitreous brown quartzite

Provenience: 30-40 cm B.S.

L 23.85 mm W 20.9 mm Th. 6.3 mm

Outline: rectangular/contracting

Cross-section: plano-convex

Margin of retouch: distal

Length of retouched margin: 19.75 mm

No. 182 Microscopically retouched flake

Unit: B Vitreous brown quartzite (6-C)

Provenience: 30-40 cm B.S.

L 15.5 mm W 24.2 mm Th. 3.5 mm

Outline: trapezoidal/expanding

Cross-section: plano-convex

Margin of retouch: left

Length of retouched margin: 17.45 mm

No. 188 Microscopically retouched flake

Unit: B Vitreous brown quartzite (6-C)

Provenience: 30-40 cm B.S.

L 26.4 mm W 9.0 mm Th. 4.1 mm

Outline: rectangular/lamellar

Cross-section: concavo-convex

Margin of retouch: right

Length of retouched margin: 19.5 mm

No. 212 Microscopically retouched flake

Unit: B White quartzite (7-C)

Provenience: 30-40 cm B.S.

L 11.95 mm W 15.8 mm Th. 3.65 mm

Outline: trapezoidal/expanding

Cross-section: concavo-convex

Margin of retouch: distal

Length of retouched margin: 16.9 mm

No. 351 Microscopically retouched flake

Unit: G Black chert (1-A)

Provenience: 20-30 cm B.S.

L 23.2 mm W 9.6 mm Th. 1.85 mm

Outline: linear

Cross-section: concavo-convex

Margin of retouch: distal

Length of retouched margin: 7.5 mm

No. 353 Microscopically retouched flake

Unit: G Grey chert (1-C)

Provenience: 20-30 cm B.S.

L 28.6 mm W 16.35 mm Th. 3.2 mm

Outline: linear

Cross-section: concavo-convex

Margin of retouch: left

Length of retouched margin: 15 mm

No. 176 Thinned flake (Plate 6h)

Unit: B Vitreous brown quartzite (6-C)

Provenience: 112 cm N 50 cm E 34 cm B.S.

L 43.8 mm W 36.4 mm Th. 12.2 mm

Outline: trapezoidal/contracting

Cross-section: bi-convex

Margins of retouch: left; right

Length of retouched margins: left 7.3 mm; right 9.85 mm

Angle of retouch scars: left 38°; right 38°

Length of retouch scars: left 1.65 mm; right 9.85 mm

Retouch scars: left: continuous and adjacent

right: discontinuous and adjacent

No. 179 Thinned flake (Plate 6b)

Unit: B Vitreous brown quartzite (6-C)

Provenience: 30-40 cm B.S.

L 25.0 mm W 25.65 mm Th. 6.7 mm

Outline: trapezoidal/expanding

Cross-section: bi-convex

Margin of retouch: right

Length of retouched margin: 15.5 mm

Angle of retouch scars: 36°

Length of retouch scars: 1.55 mm

Retouch scars: continuous and overlapping

No. 454 Thinned flake

Unit: J Vitreous brown quartzite

Provenience: 30-40 cm.B.S.

L 49.6 mm W 42.8 mm Th. 17.65 mm

Outline: trapezium/expanding

Cross-section: bi-convex

Margin of retouch: distal

Length of retouched margin: 14.45 mm

Angle of retouch scars: 34°

Length of retouch scars: 0.9 mm

Retouch scars: continuous and adjacent

No. 178 Blunted flake (Plate 6f)

Unit: B Black chert (1-A)

Provenience: 164 cm N 87 cm E 36 cm B.S.

L 15.0 mm W 12.75 mm Th. 3.2 mm

Outline: trapezoidal/expanding

Cross-section: concavo-convex

Margins of retouch: proximal; left

Length of retouched margins: proximal 14.4 mm; left 15.0 mm

Angle of retouch scars: proximal 67°; left 61°

Length of retouch scars: less than 1 mm

Retouch scars: continuous and overlapping

No. 195
196
Unit: B Blunted flake (Plate 6a)

Black chert (1-A)

Provenience: 30-40 cm B.S.

L 14.8 mm W 23.3 mm Th. 5.45 mm

Outline: trapezoidal/contracting

Cross-section: bi-convex

Margin of retouch: left

Length of retouched margin: 7.8 mm

Angle of retouch scars: 55°

Length of retouch scars: 1.15 mm

Retouch scars: continuous and adjacent

No. 451 Bevelled flake (Plate 6e)

Unit: J Vitreous brown quartzite (6-C)

Provenience: 30-40 cm B.S.

L 24.65 mm W 22.3 mm Th. 6.2 mm

Outline: rhomboid

Cross-section: plano-convex

Margins of retouch: distal; proximal; left; right

Length of retouched margin: distal 17.6 mm;
proximal 20.0 mm; left 20.7 mm; right 21.0 mm

Angle of retouch scars: distal 52°; proximal 63°;
left 49°; right 45°

Length of retouch scars: distal 3.6 mm; proximal 5.6 mm;
left 3.45 mm; right 2.95 mm

Retouch scars: continuous and adjacent

No. 453 Bevelled flake (Plate 6d)

Unit: J Vitreous brown quartzite (6-C)

Provenience: 30-40 cm B.S.

L 25.0 mm W 26.55 mm Th. 6.9 mm

Outline: trapezium/expanding

Cross-section: bi-convex

Margins of retouch: distal; right; left

Length of retouched margins: distal 22.9 mm; right 7.8 mm
left 1.4 mm

Angle of retouch scars: distal 85°; right 60°; left 70°

Length of retouch scars: 2.0 mm

Retouch scars: discontinuous and adjacent

No. 462	Bevelled flake (Plate 6g)
Unit: J	Blue-black chert (1-B)
	Provenience: 40-50 cm B.S.
	L 21.4 mm W 22.8 mm Th. 5.75 mm
	Outline: triangular/contracting
	Cross-section: bi-convex
	Margins of retouch: right; left
	Length of retouched margins: right 19.4 mm; left 21.2 mm
	Angle of retouch scars: 68°
	Length of retouch scars: right 5.95 mm; left 5.95 mm
	Retouch scars: continuous and overlapping
No. 474	Bevelled flake (Plate 6c)
Unit: J	Grey chert (1-C)
	Provenience: 50-60 cm B.S.
	L 24.5 mm W 33.7 mm Th. 7.3 mm
	Outline: ovate
	Cross-section: bi-convex
	Margin of retouch: distal
	Length of retouched margin: 31.85 mm
	Angle of retouch scars: 79°
	Length of retouch scars: 5.65 mm
	Retouch scars: continuous and overlapping

No. 145 Biface fragment (side-notched projectile point base)

Unit: J (Plate 6i)

Vitreous brown quartzite

Provenience: 68 cm N 144 cm E 28 cm B.S.

L 13.0 mm W 18.2 mm (base) Th. 4.3 mm
15.5 mm (notches)

Outline: rectangular

Cross-section: bi-convex

Flaking: lamellar; shallow, grinding along right lateral margin

No. 450 Biface fragment (Plate 6j)

Unit: J Brown chert (1-E)

Provenience: 30-40 cm B.S.

L 6.8 mm W 15.45 mm Th. 4.25 mm

Outline: trapezium/expanding

Cross-section: Plano-convex

Margin of retouch: distal

Length of retouched margin: 15.45 mm

Length of retouch scars: 2.0 mm

Retouch scars: continuous and overlapping

No. 282 Pecked tool (hammerstone) (Plate 6k)

Unit: C Brown quartzite

Zone Ib-IIa

No. 149 Microscopically retouched flake

Unit: B Black chert (1-A)

Provenience: 20-30 cm B.S.

L 20.8 mm W 25.6 mm Th. 3.95 mm

Outline: trapezoidal/expanding

Cross-section: bi-convex

Margin of retouch: right

Length of retouched margin: 20.5 mm

Length of retouch scars: 0.5 mm

Retouch scars: discontinuous and adjacent

No. 409 Thinned flake (Plate 5e)

Unit: H Grey chert (1-C)

Provenience: 20-30 cm B.S.

L 15.95 mm W 15.10 mm Th. 3.0 mm

Outline: trapezoidal/contracting

Cross-section: concavo-convex

Margins of retouch: distal

Length of retouched margins: distal 7.75 mm

Angle of retouch scars: 35°

Length of retouch scars: 10.55 mm

Retouch scars: discontinuous and adjacent

No. 146	Biface fragment (Plate 5f)
Unit: B	Vitreous brown quartzite (6-C)
	Provenience: 20-30 cm B.S.
	L 30.3 mm W 12.5 mm Th. 5.25 mm
	Outline: hemispherical
	Cross-section: bi-convex
	Margin of retouch: left distal
	Length of retouch margin: 24.85 mm
	Length of retouch scars: 8 mm
	Flakes: lamellar; shallow

Level Ib

No. 139	Core fragment
Unit: B	Vitreous brown quartzite (6-C)
	Provenience: 16 cm N 8 cm E 12 cm B.S.
	L 19.75 mm W 28.65 mm Th. 18.75 mm
	Outline: triangular/contracting
	Cross-section: plano-concave

No. 271	Core fragment
Unit: C	Vitreous white quartzite (6-D)
	Provenience: 154 cm N 148 cm W 26 cm B.S.
	L 48.9 mm W 24.2 mm Th. 28.2 mm
	Outline: trapezoidal/contracting
	Cross-section: bi-planar/wedge-shaped

No. 272 Core fragment

Unit: C White quartzite (7-C)

Provenience: 130 cm N 68 cm W 23.5 cm B.S.

L 46.75 mm W 35.25 mm Th. 35.4 mm

Outline: cuboid

Cross-section: tabular

No. 535 Core fragment

Unit: C Vitreous brown quartzite

Provenience: 52 cm N 96 cm W 20.9 cm B.S.

L 24.3 mm W 16.95 mm Th. 24.0 mm

Outline: triangular/contracting

Cross-section: bi-planar

No. 534 Core fragment

Unit: C Vitreous brown quartzite

Provenience: 136 cm N 49 cm E 21.4 cm B.S.

L 23.5 mm W 25.3 mm Th. 28.8 mm

Outline: irregular

Cross-section: conical

No. 269 Microscopically retouched flake

Unit: C Vitreous brown quartzite

Provenience: 172 cm N 92 cm W 23 cm B.S.

L 14.6 mm W 19.0 mm Th. 2.75 mm

Outline: triangular/expanding

Cross-section: concavo-convex

Margin of retouch: distal

Length of retouched margin: 3.3 mm

Retouch scars: continuous and adjacent

No. 441 Microscopically retouched flake

Unit: J Vitreous brown quartzite

Provenience: 20-30 cm B.S.

L 27.4 mm W 22.7 mm Th. 5.4 mm

Outline: trapezium/expanding

Cross-section: concavo-convex

Margin of retouch: right proximal-lateral

Length of retouched margin: 28.7 mm

Retouch scars: discontinuous and overlapping

No. 440 Thinned flake (Plate 7a)

Unit: J Black chert (1-A)

Provenience: 20-30 cm B.S.

L 19.3 mm W 11.1 mm Th. 5.4 mm

Outline: trapezoidal/contracting

Cross-section: bi-convex

Margin of retouch: right

Length of retouched margin: 8.0 mm

Angle of retouch scars: 45°

Length of retouch scars: 2.0 mm

Retouch scars: continuous and overlapping

No. 446 Nicked flake (Plate 7b)

Unit: J Grey chert (1-C)

Provenience: 20-30 cm B.S.

L 22.6 mm W 14.5 mm Th. 5.4 mm

Outline: triangular/expanding

Cross-section: bi-planar

Margin of retouch: distal

Length of retouched margin: 14.5 mm

Angle of retouch scars: 45^o

Length of retouch scars: less than 1 mm

Retouch scars: continuous and adjacent

No. 267 Nicked flake (Plate 7c)

Unit: C Vitreous brown quartzite

Provenience: 139 cm N 63 cm W 14 cm B.S.

L 16.4 mm, W 13.0 mm Th. 3.4 mm

Outline: rectangular/lamellar

Cross-section: concavo-convex

Margin of retouch: right

Length of retouched margin: 16.8 mm

Angle of retouch scars: 45^o

Length of retouch scars: less than 1 mm

Retouch scars: discontinuous and adjacent

No. 270	Blunted flake (Plate 7d)
Unit: C	Blue-black chert (1-B)
	Provenience: 160 cm N 130 cm W 27 cm B.S.
	L 30.6 mm W 17.0 mm Th. 5.0 mm
	Outline: rectangular/lamellar
	Cross-section: plano-convex
	Margin of retouch: proximal right
	Length of retouched margin: 14.25 mm
	Angle of retouch scars: 73°
	Length of retouch scars: 1.7 mm
	Retouch scars: continuous and overlapping

No. 6	Bevelled flake (Plate 7e)
Unit: A	Black chert (1-A)
	Provenience: 143 cm S 17 cm E 15.1 cm B.S.
	L 21.7 mm W 16.0 mm Th. 4.1 mm
	Outline: triangular
	Cross-section: concavo-convex
	Margins of retouch: distal right distal
	Length of retouched margins: 13.0 mm
	Angle of retouch scars: 58°
	Length of retouch scars: 5.0 mm
	Retouch scars: continuous and overlapping

No. 17 Bevelled flake

Unit: A Blue-black chert (1-B)

Provenience: 77 cm S 19 cm E 21.4 cm B.S.

L 26.1 mm W 18.2 mm Th. 11.0 mm

Outline: triangular

Cross-section: plano-convex

Margin of retouch: left

Length of retouched margin: 26.1 mm

Angle of retouch scars: 64°

Length of retouch scars: 2.5 mm

Retouch scars: continuous and adjacent

No. 138 Bevelled flake (Plate 7f)

Unit: B Brown chert (1-E)

Provenience: 0.10 cm B.S.

L 21.9 mm W 22.75 mm Th. 4.9 mm

Outline: triangular/expanding

Cross-section: bi-planar

Margin of retouch: distal

Length of retouched margin: 22.75 mm

Angle of retouch scars: 62°

Retouch scars: continuous and overlapping

No. 237 Bevelled flake (Plate 7g)

Unit: C Vitreous brown quartzite (6-C)

Provenience: 12 cm N 90 cm W 4.5 cm B.S.

L 26.15 mm W 24.75 mm Th. 5.6 mm

Outline: square

Cross-section: concavo-convex

Margins of retouch: distal; proximal; right; left

Length of retouched margins: distal 23.85 mm; proximal 19.75 mm; right 24.40 mm; left 23.85 mm

Angle of retouch scars: distal 75°; proximal 76°; right 61°; left 61°

Length of retouch scars: distal 3.4 mm; proximal 6.1 mm; right 2.4 mm; left 3.0 mm

Retouch scars: continuous and overlapping

No. 533 Bevelled flake (Plate 7h)

Unit: K Vitreous brown quartzite (6-C)

Provenience: 78 cm N 33 cm E 23.6 cm B.S.

L 32.8 mm W 29.8 mm Th. 7.4 mm

Outline: trapezium/contracting

Cross-section: plano-convex

Margin of retouch: proximal

Length of retouched margin: 29.6 mm

Angle of retouch scars: 78°

Length of retouch scars: 9.0 mm

No. 238 Biface (bifacially retouched flake) (Plate 7i)

Unit: C Vitreous brown quartzite (6-C)

Provenience: 86 cm N 136 cm W 13.5 cm B.S.

L 45.75 mm W 41.7 mm Th. 8.3 mm

Outline: rectangular/contracting

Cross-section: bi-planar

Margin of retouch: distal

Length of retouched margin: 48.0 mm

Length of retouch scars: 7.9 mm

No. 239 Biface (bifacially retouched flake) (Plate 7j)

Grey chert (1-C)

Provenience: 4.5 cm N 40.0 cm W 10 cm B.S.

L 28.1 mm W 46.65 mm Th. 14.85 mm

Outline: trapezoidal/expanding

Cross-section: concavo-convex

Margins of retouch: right; distal; left

Length of retouched margins: right 21.5 mm; distal 2.55 mm
left 10.9 mm

Length of retouch scars: right 1.65 mm; distal 1.75 mm
left 0.95 mm